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WINTER GREENERIES AT HOME.

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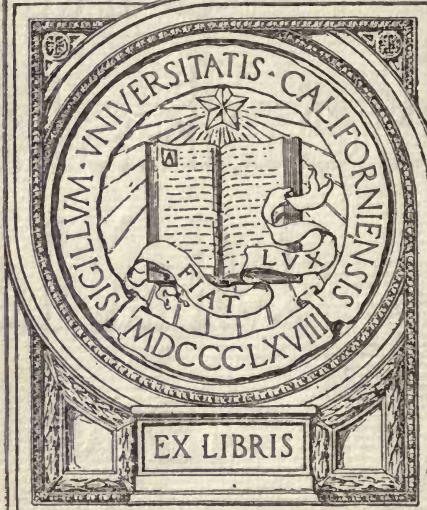

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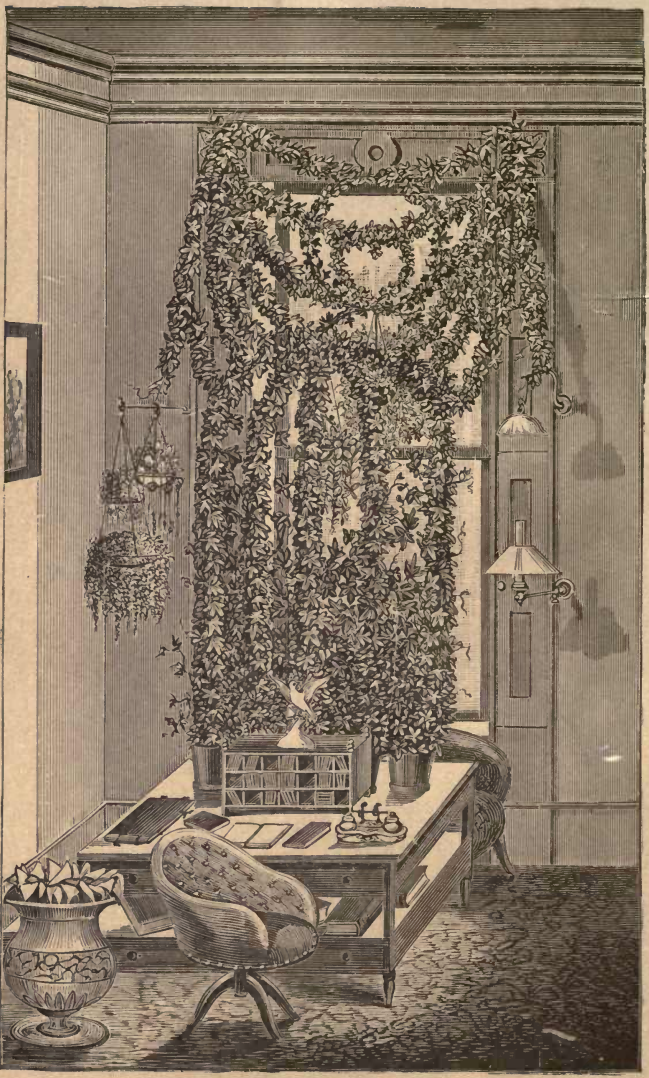

THE STUDY TABLE AND WINDOW NUMBER ONE.

[*Frontispiece.*]

Winter Greeneries

AT HOME.

BY

EDWIN A. JOHNSON, D. D.,

AUTHOR OF "HALF HOUR STUDIES OF LIFE," "THE LIVE BOY," ETC.

ILLUSTRATED.

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PREFACE.

My Dear Uncle:

A few of us girls—they call us "young ladies," but I like *girls*, and we *are* only young girls—have been trying to keep plants in our rooms through the winter. We are Rose and Lilly Richmond, Mary Miner, Jennie Weeks, Daisy Burritt, and myself.

We began last winter in a small way, and made rather sorry work of it. So many of our plants either died outright, or just lingered along like invalids. But a few did tolerably well; so we are not entirely discouraged, and we are not going to give it up yet. We have no trouble with our pets in summer time; it is all in winter. Oh, if we only had a greenhouse! But that's out of the question.

I know well enough that we need help. We have tried to get it from books; but the few that we have seen have a great deal more to say for outside gardens and rich men's conservatories than for our poor little greeneries. We have questioned Judge Kent's gardener, and have found out some things from him; but he has never tried plants in rooms like ours, except to bring them in for a little while from the greenhouse; and so he can't tell us exactly what we want to know. All our friends who try to keep plants through the winter are but little, if any, better off than we are. We have frequently compared notes with them, and, of course, have gained a little; but it is, oh, *so very* little!

But now we begin to have hope. Before Aunt Mina left us last week (what a delightful visit we have had with her!) she told us about some of your experiments, and how much interested you are in all such small attempts at floriculture. You didn't "profess to be a florist," she said, but she was sure that you could tell us many of the very things we need to know; and she thought you would be willing to write us a few plain letters about our plants, but I must write first, and ask you.

So, now, please do! That's a dear, good uncle. Tell us all about that embowered study of yours. How I wish we could see

it. Write as many letters as ever you can, and tell us anything, everything; for we are fearfully ignorant in floriculture—little better, in fact, than "babes in the woods."

Rose and Lilly say: "Won't it be nice to have *such* instruction—plain and familiar, and *just for us*, you know."

So say all your humble petitioners; and we promise to be very faithful disciples, too. I am sure one of the most grateful will be

Your affectionate niece, FLORA.

Whether the letters written in response to the foregoing fully met the glowing expectations of Flora and her friends, or not, they seem to have found a very cordial appreciation, and to have been of some real service. Of which fact no better proof could be given than the unanimous request of the fair florists, that they be put into book-form:

"So that each of us can have a copy, and anybody else that wants one; and as they have helped us, why will they not help other girls, too?"

Of course there could be but one answer to such an appeal—the publisher consenting.

Accordingly, the letters, having been pruned of mere appendages, and somewhat enlarged, now form the chapters of this unpretentious book. Is any apology needed for allowing it to retain the freedom of a private correspondence? The author ventures to hope that, with such familiarity of style, it may prove to be only the more acceptable, and that, as a simple primer of floriculture, it may afford to the "girls," in many happy homes, some encouragement in the first care of their "Winter Greeneries."

E. A. J.

ALLEGHENY CITY, PA., 1878.

WINTER GREENERIES AT HOME.

CHAPTER I.

PLANTS AS COMPANIONS.

HAVE you ever read the charming little story called "Picciola"? (Pronounced *Pet-chee-o-la.*) No? Then there is something for you to do at the very first opportunity. If you answer yes, I think it altogether probable that you have not forgotten the part of the singular heroine. However, let me remind you.

Count Charney, a proud, misanthropic, and atheistical philosopher, is detected in some political conspiracy against the first Napoleon, and is thrown into the fortress of Fenestrella, one of the prisons of State. Here he is confined in a bare and gloomy chamber, cut off from all communication with the outside world, with no attendant but his jailer; no books, pens, or paper; no employment whatever but thinking his own bitter thoughts, writing with charcoal on the walls, or carving fantastic designs on his table. One privilege alone is allowed; for two hours each day, in favorable weather, he may walk under the sky in the small paved court of the prison. After long months of such solitary confinement, he is

one day pacing this court, when he happens to notice a slight upheaval of earth between the stones of the pavement, and on examination finds a small plant pushing its way upward. This is "Picciola"—*la pauvre picciola*, "the poor little thing," as the kind-hearted jailer calls it. Perhaps it is only a "Gilly-flower," but it brings a wonderful relief to the prisoner. It becomes his care and study, his companion and instructor, and finally the means of his deliverance from both skepticism and prison, and of his marriage to a far higher "Picciola."

A delightful story of—love? Let us say of very humble, but successful floriculture—of floriculture under the most unfavorable circumstances, and yet with the happiest results. To say the least, it is a touching picture of companionship between a lower and a higher form of life—the plant and the man.

Can you for the moment put yourselves in the place of the prisoner of Fenestrella, and really understand the subtle charm of his mute companion? How it stole into his heart, beguiled his hours, changed his fortunes! And yet nothing seems exaggerated, or in any respect improbable. The story describes only the natural progress and the very possible results of the plant's influence on one in the peculiar circumstances of the Count.

Happily, you have no such need of it as he; though I have *heard* of young ladies who were quite as much at a loss for something agreeable to do during the cold, stormy days of winter. Their in-door sources of enjoyment were so scanty that—on their own testimony, it is said—home seemed to them almost a prison. What a pity!

But, for any one, *winter* is itself a sort of prison at the best. It may not confine you to the house, or really diminish your home delights, but for long months it sternly interposes its icy barriers between you and all the verdure of gardens and fields and woods. Under such

circumstances who does not feel the blessed influence of some rescued bit of summer, some "Picciola" sheltered in the home. It may be only a pot of Ivy, or a feeble "Gilly-flower," but it is something *green* and growing in the midst of wintry bleakness and desolation. It bears a message from the once verdant fields, speaking of life and sunshine, of nature and God. It may do a work not unlike that of the prison plant. And many there are who need its service nearly as much as the Count of Charney; not perhaps to furnish employment, or to correct error, but to soothe, cheer, and refine by the influence of a most gentle companionship.

But I hear you ask: "Why did not he get such service before, while in possession of his vast estates?"

That question goes deeper into the mysteries of human life than perhaps you are aware. Who can say that it was not an overruling Providence that brought the proud atheist to bend before the humble plant, and there surrender his unbelief? Only in the confinement and solitude of the prison would he be likely to notice it at all, or be in any proper condition to accept its lessons. It was by the very stress of circumstances that teacher and learner came so near together that instruction could be given and received.

And is it not so to some extent with you? Though you are not the victims of such misanthropy and atheism, yet, like the Count, you may learn many wonderful things from one little plant, and are most likely to do so in winter time, with the plant for a companion.

"If our plants would only grow like his," do you say?

Well, yes, that is important. Poor companions, they that never grow at all in any sense. But you have a much better place for yours than the crevice of an exposed pavement, and need not be discouraged.

"But how did he succeed so well?"

I think he would tell you, if he could, that it was because

he *loved* "Picciola." His sympathy with the plant, imprisoned like himself, soon grew into an affectionate attachment, and his awakened curiosity became a deep and intelligent interest. He studied the little plant until he could interpret its language, understand its needs, feel the charm of its beauty, and read its marvelous designs—proofs of a great Designer. So he became its pupil, friend, and guardian. Is it any wonder that "Picciola" grew and bloomed under such loving care? Was not that the true secret of the Count's success?

You ask me to tell you how to treat your plants. Ask them, also, and they will tell you in some particulars, at least, and much more to the point than any words of mine.

Such wide-awake observers as you must have noticed how your plants talk through their most sensitive organs. When the leaves wilt and droop, they say in the plainest kind of English: "Water! water!" Their curling and shrinking calls upon you to save them from ravenous little insects. If they fade and fall, they admonish you that something is wrong, and needs your attention, perhaps at the roots. If you give them a bath when stained and dusty, how fresh and bright their thanks. How lovingly they turn to the light, and rejoice in the sunshine! You yourselves could not say more plainly than they: "It is a beautiful day." And then in their wonderful structure and growth, how they talk of the great Provider, of His perfect wisdom and constant care, reaching even the smallest of His creatures. So "Picciola" talked to Charney, and led him out of bondage and darkness into liberty and light. So also will your plants bear you pleasant company if you give them intelligent heed. It was for the best of reasons that One said: "Consider the lilies."

Of one thing I am sure—the more you study your plants, the more will you be interested, pleased, and

profited. As you cultivate them, you will really cultivate yourselves. Do you ever think of them as being more than companions, and in some sense your *relatives?* Such is the fact, for they have the same wonderful thing called *life*. It is in a lower form, but is equally a divine gift, full of mystery and meaning. Perhaps this accounts for the sympathy that comes with their acquaintance, the peculiar interest and charm of their companionship.

This sympathy with nature in all its varied life is well worth cultivating. It is a most desirable element of character, as well as a rich source of happiness. It may be cultivated the whole year round, and does not require of necessity the costly appointments of a greenhouse. You are with your plants in the "living-room" much more than you could be in either greenhouse or garden, and so have abundant opportunity even in winter time of becoming acquainted and interested.

In such case, the love of plants will surely grow, as surely with you as with Charney, or others more like you. Why, I have seen grave men and venerable matrons become as enthusiastic over their "Picciolas" as any little boy over his first pair of boots; and I have always observed that such persons bear a sort of perpetual youth—the summer of the heart in the winter of age. Is not this the result of their interest in all growing life?

I hardly need say to you that it is a very different thing to cultivate plants merely for fashion's sake, because it is accounted "the proper thing to do," or in order to hear some one say: "Oh! your plants are *so* much nicer than Miss Grundy's." Such a motive as that seems to be almost a desecration, and certainly it can never have the rich reward that comes from the true love of "Picciola."

This letter is already long enough for the first, and yet I can not close it without some reference to the connection between "Picciola the plant" and "Picciola the maiden." How natural, poetic, beautiful! It was fit-

ting, indeed, that the maiden should supersede the plant, when the latter had accomplished its mission; but how much were both she and the Count indebted to that "little thing." Is it any wonder that they carefully removed it to the home of their freedom and love, after it had so happily opened their way to such a home?

The plant may well be associated with the maiden or the matron in every home, whether it be cottage or palace, a prison or a paradise. It would certainly help to make the brightest abode more attractive, and the dreariest more tolerable. Even the man of sternest mould could not remain wholly insensible to the charms of winter verdure and bloom. And who is so competent a guardian of such charms as the refined and gentle woman? Home, as her own peculiar realm, is worthy of all possible adornment; and here she may bring into her service, if not the costly treasures of art, at least the simple and inexpensive beauties of nature. Whatever may have been Adam's part in Eden, the work of Eve, it seems to me, must have been with the smaller plants and flowers—the "Picciolas" that helped to make her paradise.

But *you* have already learned this lesson of the story, and of Eden. Proof of it, not only in your own "little greeneries," but in your very names. What a coincidence! Rose, Lilly, Daisy, Flora—is there a Viola or Camellia? Your love of plants must be directly inherited, if your names were given by your parents. Is there some resemblance between you and the flowers? Probably much more than between the two "Picciolas." At any rate, you are lineal descendants of the first fair Florist, and may justly claim the inheritance of plants as companions.

CHAPTER II.

THE NEW EDEN.

THE LIVING-ROOM.—THE CLIMATE.—OPENINGS SKYWARD.—WHAT MORE?—A SIMPLE SPECIMEN.

THE site of the old Eden, they say, is forever lost. Well, it could be of no possible use to us now. Were we to find it, we could not occupy it. Besides, we have each the power to open a new Eden of our own. The site of that is the question of present interest.—*Where* shall our Eden be?

THE LIVING-ROOM.

"In the old house at home," of course. The conservatory or greenhouse being "out of the question," as you say, the only place available is the "living-room" at home. But a real Eden always means home. It would be much less than Eden, or none at all, if we could not live in it. So it is settled that ours must be just where we are. If, however, there is an opportunity of choosing between different rooms, we may well accept it.

The kitchen is often the best place to be found, especially if it is large, and has sunny windows. It is more likely than other rooms to have an atmosphere charged with moisture, and frequently changed by the temporary opening of an outside door, besides being left in darkness after the work of the day is finished. And does not the kitchen need to be made more like an Eden than it ordi-

narily is? Would not its very necessary and really honorable work be rendered more attractive by the company of verdure and bloom?

If the kitchen is not available for our purpose, perhaps there is a well-lighted chamber, which may be warmed from the hall or an adjacent room. If it is generally unoccupied at night, or during the evening, it is so much the better, and may be made to furnish the most important conditions required for the cool greenhouse plants. Next in advantages for such plants is the moderately and evenly heated parlor, and last of all the commonly overheated sitting-room. But the last for some purposes may be the first for others; and if this room must resemble a hothouse, it is the best for hothouse plants.

Whatever "living-room" may be selected, it is doubtless not quite so well adapted to our plants as to ourselves. It is not their natural home within doors, and they have no power of helping themselves by going out for a change. But were not plants and people made to live together, more or less? And, in these artificial conditions, can we not make some compromise which shall be favorable to both?

It is an important fact, and one often overlooked, that for the most part what is good or bad for the plants is equally so for us. Do they need pure air and abundant light? So do we. Do they suffer from the parching dryness of our rooms? It is bad for us. Are they choked with the dust from our carpets? How we sympathize with them. Some tropical plants require a tropical heat, but our most familiar friends are temperate in their demands—perhaps more temperate than we. On the whole, we thrive best in just such a condition of our living-room as is best for our plants; that is, in as near an approach as is possible to out-door summer. And isn't that something like Eden?

So the artificial arrangements of our garden are to have in view the health and comfort of all its occupants alike, and must follow very closely the larger pattern furnished by Nature.

THE CLIMATE.

As it is winter time, our first care is the artificial temperature; and, of course, we need the service of that infallible detective, *a good thermometer*. I need not tell you that Jack Frost must be kept out entirely. He stands ever ready to enter, and his entrance would be as fatal as that of the "old serpent."

The heating apparatus must, therefore, have the "gift of continuance." It may be a furnace, if its air is drawn from the outside instead of the cellar. An anthracite "base-burner" is cheaper, and, if well managed, it never fails; but any common stove or grate may be made to serve our purpose by adding fresh fuel at night, and covering with coal-slack or ashes.

As a further precaution on very cold nights, the plants should be drawn back from the windows, or covered with sheets of newspaper in the form of an inverted sack. If the covering is closed tightly at the top and sides, it holds the warm air around the plants for some time, and the temperature of the room may drop temporarily even to the freezing point without injury. An ingenious friend of mine, whose house is rather open, has a light frame-work closely covered with two or three thicknesses of paper, into which he puts his plants when necessary, and so keeps them safe in the coldest nights.

In managing our night temperature, we shall find one thing in Nature's pattern exactly suited to our convenience. Summer nights are cooler than summer days. All plants require a lower temperature in darkness than in light—lower by at least ten degrees. They need rest as well as we, and this is their way of taking it. So a

temperature which would be slightly uncomfortable for us while sitting up, is the better for our plants at night; and if we are sure of 45 or 50 degrees Fahrenheit, we may sleep without fear for their safety.

Perhaps you have noticed another interesting and convenient fact. Your rooms, divided in a vertical scale, have several degrees of *latitude*. The ceiling inclines toward the Tropics, and the floor toward the Arctic Zone. That is to say, the hottest air is at the top, and the coldest at the bottom. Between the two extremes there is ordinarily a difference of ten or fifteen degrees of the thermometer. This difference we shall find to be of use when we come to fix the regular places of our plants; but at present it gives us the hint to guard against freezing at night by lifting them up from the floor.

OPENINGS SKYWARD.

Next in importance to the heating is the lighting of our garden. Here we shall meet a difficulty which arises partly from the unfavorable construction of our dwellings, and partly from the bad habits of their owners.

Antiquarians tell us that at some remote period of the past—since the first Paradise was lost—our ancestors for many generations were reduced to the extremity of dwelling in dark caves. "Troglodytes" these cave-dwellers are called; and if they are not exactly *our* ancestors, some of their lineal descendants are still to be found. Otherwise, how can we account for the fact that so many people have a strange preference for darkness, and carefully exclude from their homes every ray of the blessed sunlight? It really does seem to be something in the blood—a remnant of barbarism transmitted from the dwellers in caves. At any rate, I am sure that just in proportion as light enters the mind, it is welcomed to the home. Besides, how absurd is the very idea of an Eden without sunshine!

We must, therefore, have sunshine at any cost; and as we have no openings in the ceiling, we must take them at the sides. I hope your windows do not open due north, for in that case you are limited in winter to a comparatively few kinds of plants, and must give up nearly all hope of bloom. The direct southern, or rather southeastern, exposure is by far the best; and next in order of value are the other points of the compass toward the east and the west.

If we were to find a *large, sunny bay-window*, we might be pardoned for going into raptures at once. It would have several very decided advantages, furnishing a greater abundance of light, and from three sides, instead of one, besides affording the opportunity, if desired, of shutting off the plants from the main room by curtains or glass doors, making, in fact, a sort of parlor conservatory. Certainly there could be no better place in which to plant our home-made Eden.

But taking the best windows that we have, let us make the most of them. We can not afford to cover up a single square inch of the glass, except with vines. In their native homes, the most of our plants are accustomed to floods of light all day long, and they can not, therefore, have too much of it with us. If some need less than others, we can easily find shaded nooks for them after admitting all the light we can get. So, if there are inside shutters, throw them open; if curtains, roll them up *to the very top*. They can be closed again at night, you know, and will then help to exclude the cold; but during the day we must have light from the whole window, and especially from the part nearest to the sky. The rays coming through that part are more direct than from below, and fall upon the plants at the window in a line more nearly vertical. It is a good thing for plants as well as people to *look upward*.

WHAT MORE?

Sufficient warmth and light having been secured as the chief and indispensable conditions, the fixtures necessary for the accommodation of our plants might next be considered; but the description of these in detail I must reserve for some future letter. You will find many ingenious but simple devices, varied enough to utilize all the space in your windows, and suit the needs of all your plants.—Stationary or swinging brackets, to be fastened to the side-casings at different points from the bottom upward, as high as you can reach, toward the Tropics; hanging baskets of either wire and moss, or terra-cotta, to be suspended from wire loops let down from the casing, or on a rod fastened across the window from side to side; a long, narrow box, filled with plants in pots, to be kept under the window, etc., etc.

But the completeness of our proposed Eden will depend much more upon its occupants than its furniture. If the plants are suited to the place, and properly treated, they will grow and thrive to such an extent as quite to eclipse their fixtures, whether cheap or costly. It is this luxuriance and beauty, *on their part*, that brings the thought of Eden, and justifies the name; and, on our part, is it not the *appropriate character and tastes?* With these, then, we may hope for complete success.

A SIMPLE SPECIMEN.

Do you wonder how this Eden will look when planted and put in order? You ask me to tell you about the one in which I write, "all about that embowered study" of mine. If I am to do it at all, perhaps this is the time; but an Eden must be seen and enjoyed rather than described. However, since you can not see it now, and because it is not elaborate and expensive, but is very simple, and easily made, I make an attempt at its description.

The heating apparatus is an anthracite "base-burner," which has served me faithfully for a dozen winters. At small expense, and with little attention, it keeps a moderate and steady heat night and day, without a moment's intermission, from December to May. It can be regulated by dampers and drafts to a higher or lower point of heat, and there it holds for many hours, until the draft is changed.

Shall I tell you one of my conceits? This stove has seemed to me to be the type of a most excellent character for ourselves—steady-going and ever faithful, regulated by principle rather than impulse, never cold, and never over-hot, but always giving forth a useful heat from a warm heart. Of course, I consider a stove of such qualities an indispensable and most worthy servant in my little Eden.

The "embowered study," as you call it, is on the second floor, and extends over the parlor below, and also, in its front half, over the lower hall. The part over the hall, instead of being a room by itself, as in many houses, takes the form of an alcove, which opens into the main part under a corniced arch extending across its entire width. The three front windows have an exposure a little south of west—not the best, you see; but they have one pane of glass to each sash, and reach nearly to the ceiling, which is eleven feet high, and this is some compensation. The room is thus well opened to the sky, and has a great abundance of light.

As the rear of the room is given up to books, I have to describe only these front windows, and will take them in order, beginning at the left. Perhaps the accompanying sketches (figures 1 to 5), despite their unavoidable imperfections, may afford some aid to my words and your imagination.

Let us first look at window *number one*, the sketch of which a fancy of the publishers has caused to be used as

a frontispiece, thus conferring upon it now the honor of beginning the book.

Well—directly in front of window *number one*, and three feet distant from it, stands my study table. On the corners toward the window are fixed two posts about the length and size of broomsticks, and another near the center of the table. These are connected at the top by semi-circular pieces of stout wire, thus making a frame-work in the form of an *arched concave niche*, opening toward the window. From the center of the arch is suspended a "mother-of-pearl" shell, containing a "drooper"—*Tradescantia vittata*. On the table within the niche are placed eight pots of Ivy—*Hedera*—each containing a distinct variety. These ivy vines entirely cover the frame-work, and pass in graceful festoons from the top of the arch upward and over to the top of the window, and thence downward and around two large wire hoops, which are arranged like the figure 8, and are suspended near the glass. Within the lower hoop hangs a cocoanut, containing the delicate-leaved *Mahernia odorata* (of the catalogues, but properly *M. Verticillata*), which is in fine contrast to the encircling Ivy. At the side of the window, next to the wall, are swinging brackets, one of which holds a hanging basket filled and overflowing with *Lycopodium*, and just above it a pot of *Isolepis gracilis*. If you were now seated in the easy-chair between the window and the table, you would find it, I think, as perfect a bower as any summer-garden could furnish.

The middle window, *number two*, (which is shown in engraving No. 2,) is entirely different in its plants and their appointments. At a point as high as I can reach conveniently is a stout iron rod, which extends horizontally across the window, and curves outward into the room far enough to keep plants from touching the glass, and to allow free play for the inside "panel shutters." On this rod, at the center, I have a small vine in a shell,

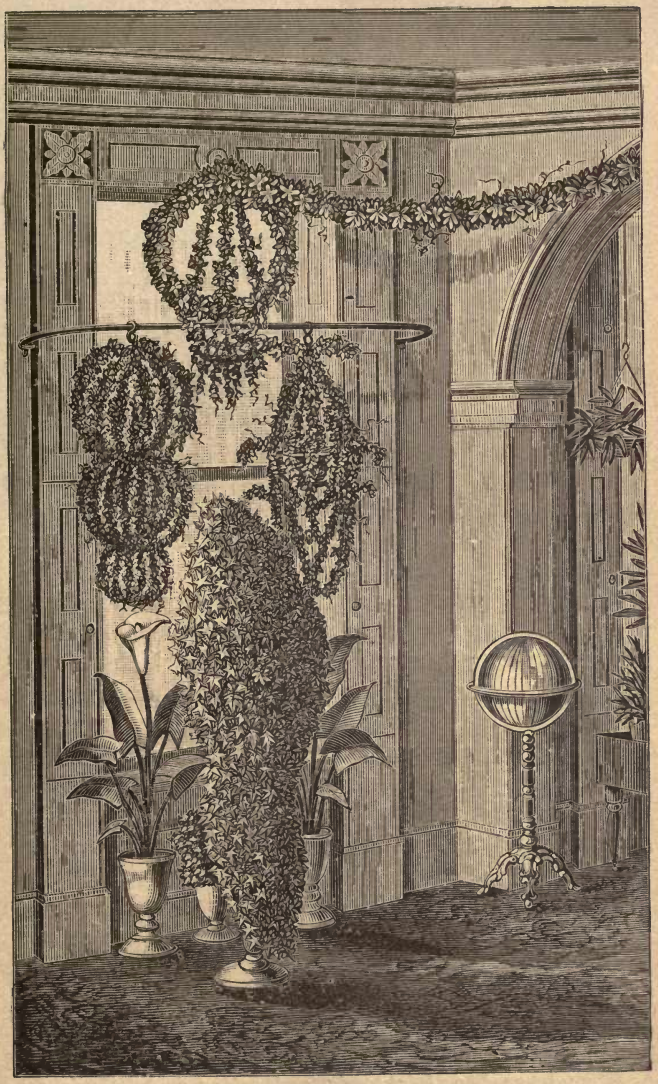


Fig. 2.—WINDOW NUMBER TWO AND PART OF ARCH.

and, near the sides, large hanging baskets, or basins, of terra-cotta, filled with vines, which grow upward and downward in dense masses. One of these vines is a *Ficus repens*, exceedingly beautiful and flourishing. At the center of the window, between the two hanging baskets, but farther out in the room, is a large wooden vase about thirty inches high, and fitted with casters. This holds a small pot of variegated Ivy, which droops over toward the window and covers the vase, and also a large pot of the dark green small-leaved variety—*Hedera gracilis*. From this large pot a light frame-work of wire is carried up about four feet, somewhat in the shape of a balloon, or the longitudinal section of a balloon, with the convex side toward the window. On this the vine is trained so as to form a close mass of foliage, the most beautiful of window-screens. On the floor, close to the window, are two terra-cotta vases, sixteen inches high, containing tall *Callas*, nearly ready to bloom; and between them is another having an *Ardisia crenulata*.

Window *number three* (shown in engraving No. 3) looks out to the sky from the alcove. The whole side of it next to the wall, as will be seen by the sketch, is covered with vines climbing or trailing from pots fixed on swinging and stationary brackets. At the center are two hanging baskets, one directly below the other and attached to it. The upper one contains the delicate *Linaria Cymbalaria*, and the lower one the broad-leaved *Begonia manicata*. Further to the left is another hanging pot, filled with *Hoya carnosa*, or Wax-plant. At the bottom of the window is a low, narrow bench, or table, fitted with casters, and made to support a garden bed. This is a box four or five feet long, twenty inches wide, and six inches deep, with an inch of sand on the bottom, and the top just even with the window-sill. It is filled with plants in pots; several exotic ferns at the shady end, such as the *Dicksonia antarctica* and *Pteris ser-*

Fig. 3.—WINDOW NUMBER THREE, WITHIN THE ALCOVE.

rulata; then a flourishing *Ficus elastica,* or India-rubber tree; a fine palm, *Latania Borbonica,* at the center; a *Passiflora cærulea, Myrtus communis, Euonymus,* Carnations, and other small plants "too numerous to mention." No garden bed in summer ever looked more fresh and inviting.

The alcove arch, before mentioned, springs from the front wall at a point midway between the windows number two and three, and has a span of seven or eight feet; this is shown in figure 4. Under this arch, at the end farthest from the windows, is a quartette stand, holding at its center a globe-shaped Ivy, and at its ends two large-leaved Ivies exactly alike and of luxuriant growth. These pass up along the arch to its highest point, and thence in long sweeping curves on each side to the windows, where they will have further growth around wire forms. Within the alcove, the wall opposite the window is well covered with ivy vines, which encircle a copy of one of Raphael's "Cartoons," and grow from a pot on a black walnut bracket near the floor. In the corner, on another bracket, is a climbing fern, the *Lygodium scandens;* and midway between this and the window, several very delicate vines are suspended under an engraving, around which part of them are trained. A view of the rear wall of the alcove is given in figure 5. With vines thus covering the walls, and hanging in festoons overhead, this alcove is itself a very complete "greenery" and bower.

Probably you notice the absence of several things which you would like—a bird-cage, for instance, or a small aquarium containing water-plants and gold-fish. How easily they might be added, and worthily too!

One piece of additional furniture I have promised myself in the near future, namely, a "Wardian Case," sometimes called a "Fernery." This is especially desirable for plants which require a moister atmosphere than would be good for books, or pleasant in a living-room. As a

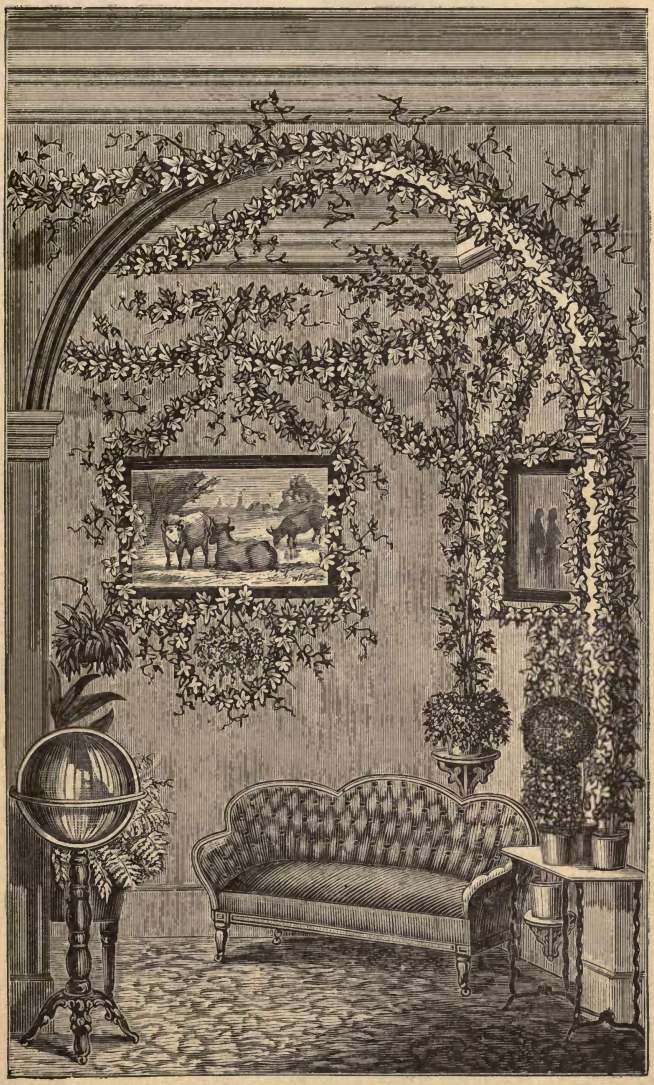


Fig. 4.—THE ALCOVE AND ARCH.

close glass cover for plants, it affords some of the advantages of a greenhouse. But "the world was not made in a day," and my bower, like yours, will doubtless improve with time.

The almost entire absence of bloom arises partly from not having a southern exposure, partly from the use of gas-light at night, even though it is shaded, and partly from the fact that Roses and most winter-flowering plants require rather more attention than I now find it convenient to give. Before spring, the deficiency will be supplied to some extent by adding a few Hyacinths in pots, and other easy bloomers; and much more might be done with a little labor and expense.

But taking the room just as it is, let me assure you that it harbors no manner of discontent. That, you know, would be altogether out of keeping with the place. The foliage itself is so fresh and abundant, and much of it so varied and ornamental in shape and tint, as to be no small compensation for any lack of bloom. With the afternoon sunshine to glorify and fill the place, and with a still brighter sunshine in our hearts, Almina Eve and myself find no difficulty in making our summer last all the year. Both of us most heartily wish you each an equally happy Eden.

HEDERA.

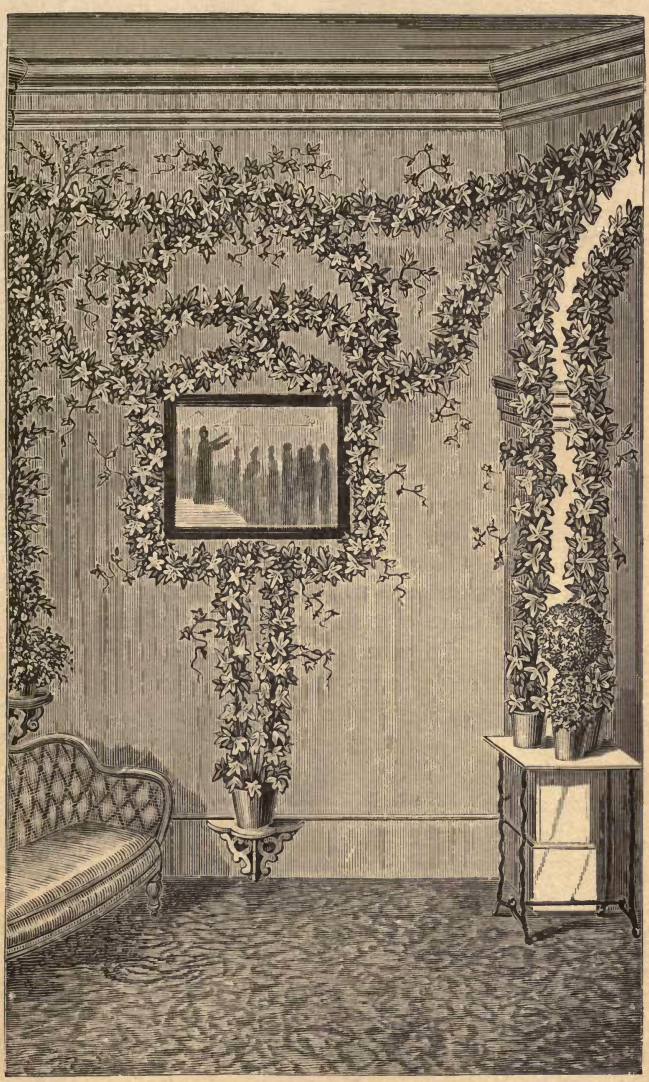


Fig. 5.—SIDE OF ALCOVE OPPOSITE WINDOW NUMBER THREE.

CHAPTER III.

SUITABLE PLANTS.

THE DIFFERENCES.—GENERAL HINTS.—SELECTIONS FOR SITUATIONS.

YOU remember that the planting of the old Eden was already finished when the gardeners took possession. It had been done by One who could make no mistakes, who put there only such plants as were sure to flourish under proper treatment. That certainly was of great advantage to the primitive florists as mere beginners. It left with them no such question as we have now to consider. It relieved them entirely from the necessity of selecting and experimenting under perplexing uncertainties. They could go to work at once with the assurance that their failures could come only from some mistake in the "dressing and keeping"—never from having the wrong plant in the wrong place.

What a help such an assurance would be to us. It might not be best for us, all things considered, but it would certainly simplify the problem presented by the failures which have led you to ask from me these letters. In that case, I might dispense with *this* letter altogether, and proceed at once to the question of proper treatment. But remembering my own early failures, as well as some later ones, I feel very sure that yours have arisen, in part at least, from an injudicious selection of your plants. Let us see.

THE DIFFERENCES.

"A few did tolerably well," you say, "but many died outright, or just lingered along like invalids."

What a pitiful sight is this lingering and dying. How much it detracts from the pleasure of keeping plants in your rooms during the winter. Many persons give up the attempt altogether, rather than watch disconsolately the daily languishing of their pets. I am glad that you have had enough of success to save you from such utter discouragement.

But why did not all your plants prosper alike? Whatever fault there may have been in the treatment, you gave them all alike the best you then knew how to give, and yet the results were widely different. "A few did tolerably well"—neither died nor became invalids. If you had taken only those few at the beginning, you would have had no failure at all; and on making another trial you would doubtless regard them as suitable plants. As for the others, the presumption is that they were the victims of unfavorable circumstances. You may take to yourselves the consoling reflection that probably, with some of them at least, no one could have done any better—that they could not have been made to flourish in your rooms by any possible art or skill. As the event seems to have proved, they were not exactly suitable. This difference of results in your first experiments with even a few plants, points to some unexplained difference in the plants themselves, by virtue of which some may be called suitable and others unsuitable.

Looking now a little further, we come to the broad fact which lies at the very foundation of floriculture, namely, the vast variety of nature and need among plants. As you know already, some live and others die in the same situation. Of course there is a reason for this. Habits and wants belong only to things having some kind of life, and

must be duly provided for in order to the support of that life. But in respect to their habits and wants, plants differ very greatly. Some grow as standards, others as climbers, or creepers, or droopers. All alike require light, heat, and moisture, but in very different degrees. In their natural situations, all these differences are fully provided for; the places are as varied as the plants themselves. In every latitude, or degree of heat; in forest-shades, or the broadest sunlight; in and under water, or at its margin; in rich, deep alluvial soil, in the crevices of naked rocks, or on dry and barren sands—everywhere, plants are found in natural conditions perfectly suited to their habits and demands.

Now, these are the plants which for the most part are cultivated in greenhouses. Almost every desirable species has its representatives, coming from all around the world. As their habits and wants are unchanged, you can see that their new and artificial conditions must be made to conform as nearly as possible to their original natural situations. If you were to visit any extensive collection, you would probably find many separate greenhouses with marked differences of light, heat, and moisture. The one problem of the florist is to *make the places suit the plants;* and just as he is able to do this he succeeds.

But with us in our "little greeneries," the problem is somewhat different, while the end in view is the same, that is, success in having only healthy and flourishing plants. We must take such rooms as we have, and of course can not alter them to supply all the varied conditions required by widely different plants. Besides, our several rooms are likely to have very considerable differences in regard to exposure, temperature, etc. But whatever they may be, they are our only places for plants. Our problem is therefore a much narrower and simpler one than that of the florist, namely, *the selection of plants to suit the place.* That is to say, we must confine ourselves to a

much smaller variety, and take only those plants to which we can give something like their natural conditions.

So, you see, it will not do to select any plants we may happen to "fancy," as we read about them in the catalogues of the florists, or see them temptingly displayed on the market-stands or in greenhouses. Many of them charm us by their wonderful beauty, and seem exceedingly desirable; but, alas, they are not for us, unless it be for a few short days, or weeks at the most. We may take them only as visitors or temporary guests. In selecting our permanent companions for the winter, we need such as can "feel at home" with us, and must decide, not by appearances, but by character and antecedents—taking into account their habits and wants, or "previous condition."

"But this," you will say, "requires a knowledge of the natural history of plants."

Very true—to some extent at least—unless you depend entirely upon other persons to judge for you. But you would prefer, I am sure, to judge for yourselves if possible. And the more of such knowledge you have, the better every way, not only in the selection, but in the care of your plants.

The information you need may be obtained, in part, from the common descriptive catalogues of greenhouse and garden plants; but much may have to be sought for diligently in larger volumes, and be rather difficult of attainment. But to you, will not this fact be stimulating, rather than intimidating? With your spirit and enterprise, the unintelligent and merely mechanical cultivation of plants would be almost stupid. You might about as well have "artificials," and be done with it. But these *living* plants are continually appealing to your intelligence and challenging your skill, while waiting to reward you with increasing beauty. They keep you constantly supplied with some interesting subject of inquiry, something

to be followed up and found out sooner or later. "The pursuit of knowledge," some one has said, "is better than knowledge itself." In this case, it gives you the habits and character of interested investigators; and its very difficulties enhance the profits. The genuine hunter finds the keenest zest of his pleasure in the chase, when it is literally a chase; but of course he brings down the game. So will you enjoy the very pursuit of information concerning your plants; and it may continue as long as you live.

But the knowledge thus acquired will itself add greatly to your pleasure in caring for your plants. It will relieve you of needless anxiety and apprehensions, and give you a certain sense of power and confidence. It will be some satisfaction to know even their scientific or technical names, and much more to feel assured of their proper accommodation in your rooms. And you will be delighted to find acquaintances beyond home, through all the gardens and greenhouses around you.

Wife and I have become so much interested in the history and habits of plants, that we get no small part of our recreation in going regularly to the greenhouses in the City Park. Only yesterday our visit there was rewarded by the sight of several exquisitely beautiful *Orchids,* and we are now anticipating the splendid bloom of the *Poinsettia pulcherrima*—plants which we could never think of accommodating in our winter greenery. Without doubt, Judge Kent and his gardener would be glad to give you all some such share in their greenhouse. People who love plants themselves, are very likely to take delight in gratifying a similar love in others.

But I must not forget that you have only just entered upon this interesting study of the habits and habitats of plants. Of course I can not accept your confession of being "fearfully ignorant in floriculture, and little better in fact than babes in the woods;" for have you not already

had the regular first lesson of experience? And yet, for the present, you may properly claim the benefit of the experience of others, especially if they are not so far advanced beyond you as to be quite out of sight. So I venture to give you a few suggestions, or

GENERAL HINTS.

1. Reject all plants which have been "forced" into bloom for the market. This caution would be of more immediate practical importance to you, if you were living here, where many of the florists cultivate plants for sale, and bring them to the market-stands in their most attractive stage. Such plants have been kept in hot-houses in a condition much like that of midsummer, and having thus reached the very acme of their growth they must soon begin to fade. Ignorant of this fact, many persons purchase them, take them home to a lower temperature, and then complain of their failures. Some of my friends who had thus become quite discouraged, have now learned the better way of purchasing from cool greenhouses, and waiting for the bloom.

My own experience on this point I shall never forget. One of the first plants brought to my study, years ago when I had a southern exposure, was a *Bouvardia*, full of buds just ready to open. How tenderly I cared for it—watched, waited, and wondered—but not a single floweret unfolded through all the winter. To use your words, it "just lingered along like an invalid." With a little reading I soon discovered the cause. In my ignorance I had obtained the plant from a hot-house where the forcing process was used to supply the cut flowers which are sold for bouquets, wreaths, etc. And I was not then aware that the *Bouvardia* naturally requires a higher temperature than I allowed in my study. Of course one lesson was enough, and I have since done all the forcing myself.

2. Take only young, vigorous, and growing plants. If well rooted before cold weather begins, they are more likely to endure the inevitable hardships of the season and situation, and you will have the pleasure of watching their growth, if not their bloom. Youth and health, you know, always bear the charm of an unfulfilled promise—are full of happy anticipations—like yourselves. Besides, full-grown plants take up more room than you can well spare; or, if cut back, they present a rather unsightly appearance. After flowering, they are generally used by florists for the growth of "cuttings."

3. Give the preference to plants which take little or no rest during the winter, or have already passed their period of rest. Some greenhouse perennials grow more or less continuously, while others make a pause of weeks or months, as if waiting for "better times." The latter, if well treated, "hold their own," and many of them are very desirable for their beauty of foliage. Nearly all may be expected to start into growth before the winter has passed. But here and there a plant seems to be very irregular and capricious. For instance, I have a fine pot of "Smilax"—*Myrsiphyllum asparagoides*—which has had a lazy fit of more than ten months; and I was just ready to throw it out, when its Asparagus-like shoots once more began to appear. Perhaps it would have done better in a different room; but it is hardly steady-going enough for me.

4. Make sure beforehand that your selections are not of *deciduous* plants, unless you like the sight of leafless stems. Near the beginning of my experiments I barely escaped a mortifying failure by observing this caution at the last moment. I was about to purchase for winter use several attractive but unfamiliar plants which were in full leaf—among them the "Crape Myrtle" and *Ampelopsis Veitchii*—when I happened to ask if they were deciduous. You are probably aware that many trees, shrubs, and vines drop

their leaves in autumn from habit rather than frost. It is their way of resting, or going into winter-quarters. Of course, you will leave all such hibernating plants undisturbed out-doors, or in the cellar.

5. Consider the texture of the leaves. As a general rule you may safely take plants having leaves tough and leathery like the *Hedera*, or hard and smooth like the palm, or the *Ficus repens*, or merely smooth and lustrous like the *Begonia manicata*. But, unless you have a "Wardian Case," beware of the tender-leaved plants, and especially of such as are fuzzy, like the *Primulas* and some varieties of the *Begonia Rex*. The leaves are vital organs of the plant, and cannot perform their functions well except when clean. All the first-mentioned submit to sponging and drenching with evident delight; but many of the latter will hardly bear the touch of water, while the hairs studding their surface catch and hold the dust of the daily sweeping. So in selecting plants for the wear and tear of the every-day room, it is very necessary to find leaves which are "warranted to wash."

6. Semi-tropical plants are generally to be preferred to the strictly tropical. Many of the latter, like the *Cissus discolor*, and the Tuberose, cannot be expected to flourish in the moderate day temperature which is most healthful for us, say of 65 or 70 degrees Fahrenheit. On the other hand, the more hardy plants of temperate regions are likely to suffer from the heat common in sitting-rooms, and would do much better in any cool, airy place, free from frost. You need therefore to take observations determining the thermal latitude of your respective rooms, and select accordingly.

7. A few plants, like the *Hedera*, bear a great deal of neglect and ill usage, and give admirable lessons in long-suffering and patience. Of course, they are all the more capable of responding appreciatively to the better treatment. Let me specially commend them to your favor-

able notice. Even such careful cultivators as you may sometimes find advantage in their excellent qualities, since "accidents will happen." To say the least, it will be decidedly pleasant, among your many very sensitive friends, to have a few which will not "feel hurt" by a little neglect, and have sufficient stamina for "roughing it" on occasion.

8. Other things being equal, choose plants which are not specially noted for their hospitality to insects. You will find a great difference in this respect, though all plants are said to be "given to hospitality," and "without grudging." Some seem to be continually overrun with guests, having become famous, I suppose, for an excellent larder; while others refuse nearly all applications for entertainment. As the food of the insects is generally the very life of the plant, and as you claim this for yourselves, you can avoid competition with them only by observing this caution. In any case, you are likely to have opportunity of studying entomology under the microscope.

9. I suppose that, on the whole, you will prefer plants which will stand by you winter after winter—the slow-growing and long-continuing sort. Like old friends, well tried and true, they have a value peculiar to themselves. An English Ivy is now growing on my study table for the *tenth* winter. It is intimately associated with all these years of my happy home life, and was part of the time all the greenery I had. What a blessing and delight it has been! But it has become so more and more with every added year, until it seems now very much like one of the family. I shall be glad to keep it as long as I live among the winters.

10. You will find it necessary to guard against the overstocking of your greeneries, when so many very attractive plants are presented for your choice. Begin with a few, concerning which you feel very sure, and increase the number gradually, as you come to a better knowledge

of suitable plants. Half a dozen, well kept and thrifty, will give you more satisfaction than a score in the condition of invalids. Allow no plant to remain after you have become convinced that it will not thrive or cannot adapt itself to the place.

11. Please keep a record of your plants, and in due time report all that do well, or even "tolerably well." You may thus contribute your share to the correction and enlargement of lists of plants suitable for culture at home in such winter greeneries as yours.

After all these hints, perhaps you will be disappointed unless I furnish some such lists for you. Well, as your experiments have had so recent a beginning, and as some of your friends may emulate your example and need help at the very beginning, I venture to suggest, chiefly from my own experience, but partly on the authority of others, a few

SELECTIONS FOR SITUATIONS.

As situations differ in respect to heat as well as light, I append to the name of each plant the degree or degrees of *night temperature* generally regarded as most suitable, with the understanding that about 15 or 20 degrees higher, according to amount of light, is the best for daytime. Practically, there may be some variation either way for both night and day; but you will find these degree-numbers a very safe guide in making selections for rooms of a given temperature, or for the higher and lower positions in the room, whatever may be the differences of situation as to light.

1. *Shaded entirely* from direct sunlight, whether in a north window, or on the south-side of east and west windows, a few kinds of plants will "do tolerably well" if properly treated, such as: *Ficus repens*, 50°—Ivies (*Hedera*), 40° to 50°—Lobelia, 45°—Madeira Vine, 50°—Tradescantias, 40° to 50°—Ferns, *Pteris Cretica alba*

lineata, and *serrulata*, and *Dicksonia antarctica*, 45° to 50°—*Achyranthes*, 50°—Agaves (Century plant), 45°—*Begonia manicata*, 50° to 55°—Euonymus, 40° to 45°—Callas, 45°—*Myrtus communis* (true Myrtle), 45° to 50°—Lily of the Valley, 45° to 50°—all Hardy Bulbs, 40° to 50°.

2. A *partly shaded* situation, having, say, two hours of either morning or evening sunshine, is much better than entire shade for any of the plants in the foregoing list, and will afford tolerable quarters for several more in the list next given.

3. In the *forenoon* sunshine, the whole or greater part of it—that of the afternoon being somewhat less suitable—any of the following will have a fair situation, if not the best: *Ficus repens*, 50°—Ivies, 40° to 50°—Madeira Vine, 50°—Agave, 45°—*Myrtus communis*, 45° to 50°—*Begonia manicata*, *B. Weltoniensis* and *B. hybrida multiflora*, 55° to 60°—Callas, 45°—Hardy Bulbs, 40° to 50°—Fuchsias, 50°—Lily of the Valley, 45° to 50°—Stevias, 45°—*Ardisia crenulata*, 45° to 50°—Centaureas, 45°—Crassulas, 45°—*Mahernia odorata* (or *verticillata*), 55° to 60°—*Linaria Cymbalaria* (Kenilworth Ivy), 55°—*Latania Borbonica* (palm), 50° to 55°—*Ficus elastica* (India rubber tree), 50° to 55°—Dracenas, 55° to 60°.

4. *Full sunshine*, in a southern or southeastern exposure, with a temperature five or ten degrees higher than in shade, is doubtless the best place for nearly all winter flowering plants, such as Roses, 50°—Carnations, 50°—Geraniums, 45°—Azaleas, 45° to 50°—Daphnes, 45°—and many others [see Chapter VI., "Winter Bloom"], and also for the following: Cactus, 50°—Coleus, 60°—*Hoya carnosa* (Wax plant), 50° to 60°—*Passiflora cærulea* (Passion flower), 50°—*Aucuba Japonica* (Golddust shrub), 45°—Palms, and Orange and Lemon trees, 45° to 55°.

5. For the *Wardian Case*, shaded from the rays of the

sun, take: Ferns, nearly all the exotic varieties, 45° to 60° —Lycopodiums or Selaginellas, 55°—Centradenias, 55°—Rex Begonias, 55°—Pilea (Artillery-plant), 50°—Draceenas, 55° to 60°—Gymnostachyums, 55°—Peperomias, 55° —Marantas, Crotons, Caladiums, etc., 60°. Such high temperature, you will understand, is more easily maintained at night in the closed case than in the open room. An entirely distinct collection—to be kept at a lower temperature—may be made of ferns, mosses, etc., gathered from our own woods.

This classification is doubtless more or less imperfect, and could not well be otherwise; but it will help you to avoid many of the most common mistakes of beginners. It embraces a sufficient number of plants for *first* selections, at least. Nearly all are "easily managed," and have been mentioned particularly on that account. But you will probably need some further advice before you will be able to give them in all respects the proper treatment. Until you can do this and prove them otherwise, you may safely assume that they are suitable plants.

FICUS REPENS.

CHAPTER IV.

PROPER TREATMENT.

THE PROPER SOIL.—SUITABLE POTS.—THEIR MANAGEMENT.—REGULATING THE RAIN.

NOW we come to actual work, the daily care of your plants; and a very pleasant work it is—having the character more of recreation than of labor. I take it for granted that you propose to do it all yourselves, each of you being sole mistress of her own separate realm. Otherwise, you will lose much of the charm and most of the profit of your "winter-greeneries." Every "Picciola" needs a Charney, and will take a substitute only when Charney falls sick. In such a case, with any of you, others of the floral company, will, I am sure, be more than competent to play the part of the kind-hearted jailer.

I can easily imagine further advantages accruing from your happy copartnership as friends and florists. What animated discussions over these letters, as you read them together! What mysterious consultations, first in one home and then in another, over the objects of your separate care, but common interest. Well, I can prophesy only the happiest results. Long live the friends of flowers! May you prosper infinitely more than your most prosperous plants; and in your best care of them, may you always find delight in the thought that you are only

humble "workers together" with Him who cares for all His hands have made.

I have said, heretofore, that our plants have a way of expressing their wants, and thus telling us how to treat them. But how much they can tell, depends altogether upon how well we can understand; and to understand it all, requires long and patient study and practice. All that the most accomplished florist knows of the proper treatment of plants, he has learned from the plants themselves, either directly in his own experience, or indirectly by the experience of others. Only in this way can any one become a master workman. As we, however, are mere apprentices to the art, we may be glad, for the present, to get its rudiments well in hand. So let us begin at the beginning with

THE PROPER SOIL.

This is a matter of primary importance, because the soil in the pots is to contain the material, which, when dissolved in water, becomes the food of the plants. Probably you know already that plants always take their sustenance in liquid form. Now, if the soil consists wholly or chiefly of *clay*, it becomes so compact and hard that the water can not penetrate to the roots, but runs off between the "ball" and the pot. We must therefore mix with the clay sufficient *sand* to make it porous and open. But to this mixture we must also add the real or chief food of the plant, namely, *well-rotted manure combined with leaf-mould* from the woods, or with decayed and finely *pulverized sod* from a loamy pasture.

As the soil in the pot is comparatively small in quantity, you can see that it ought to be of a richer quality than any you would be likely to take up at random from an ordinary field or garden. A good sandy loam thus taken will generally answer the purpose, if thoroughly mixed with an equal or larger part of a compost made of the two

kinds of plant-food already mentioned, decayed vegetable and animal matter.

It is hardly necessary to be very exact in determining the proportions of this mixture for different plants. In general, it may be said, soft-stemmed plants require a somewhat lighter or looser soil than those with hard or woody stems. Such as grow rapidly and bloom profusely, like the Fuchsia, should doubtless have a larger proportion of the leaf-mould or manure, perhaps one-half or more. The Rose certainly needs more clay than the Cactuses, natives of sandy plains ; and the Ferns seem to have a special liking for leaf-mould. In taking up any of the latter, or other plants from the woods, you will do well to bring the soil in which they have been growing. So also you may obtain hints as to the best soil for all plants, by ascertaining their natural conditions.

Great importance was once attached to the proper composition of soil for different plants. For instance, it is said of the weavers of England, that they were noted for the superiority of the Carnations cultivated in their cottages, and that the secret of their success lay in the use of this formula : "One-year-old horse-manure, one-half, and good garden soil, leaf-mould, and coarse sand, each one-sixth, duly mixed, and exposed all winter to frosts." You will still find some books and amateur florists very particular in this matter, insisting upon a specific combination for every distinct class of plants. But Mr. PETER HENDERSON, the author of several books on floriculture, and himself a cultivator of large experience, tells us that he uses about the same soil—a rich compost of decayed loamy sod and leaf-mould, or manure—for all kinds of plants in his numerous greenhouses. So I think you may safely do the same. At any rate, you can consult with Judge Kent's gardener in any emergency, and perhaps obtain from him all that you need, already prepared.

Having provided the "good ground," we now need something to hold it. So the question next in order is that of

SUITABLE POTS AND THEIR MANAGEMENT.

1. The common earthen pots, unpainted and unglazed, are by far the best. They have the recommendation of being cheap, and especially that of being *porous*. This quality is very important, because it allows a better drainage and ventilation of the soil in the pot—a condition indispensable to many kinds of plants, and especially to such as are of delicate constitution and habits. You can easily

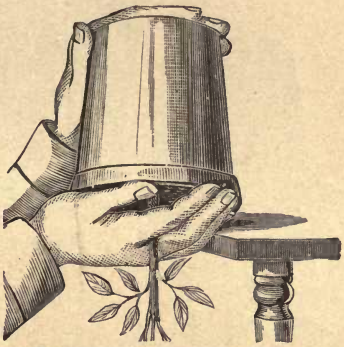


Fig. 6.—REMOVING THE BALL.

keep these pots looking well by an occasional use of the sponge, or may set them into larger sizes of the more ornamental kinds. Let them be accompanied by saucers of the same material, unless they are to stand in a garden-box having sand at the bottom.

2. The form of the pots should be—as it commonly is—that of a truncated cone, or smaller at the bottom than the top. You will sometimes need to remove the ball of earth for examination, and can not do it conveniently, if at all, with any other form.

3. To remove the ball without disturbing the roots,

place one hand on the top, with the stem between the middle fingers, then invert the pot and tap the edge of it on the table or box, as in fig. 6. If the ball does not drop easily into your hand, repeat the tapping at another point, or loosen the soil from the pot by pouring a little water around the edge, and waiting a few moments for it to soak through. It will rarely be necessary to use a case-knife, running it around the ball, as is sometimes recommended. With a little practice, you will soon be able thus to examine the ball, as in fig. 7, put on the pot and turn it right side up again, without displacing a spoonful of the soil. And such an examination will often

Fig. 7.—THE BALL REMOVED.

be necessary to make you acquainted with the condition of the roots, to remove angle-worms, etc.

4. *Use in general the smallest pot that will hold the roots of the plant without crowding.*

Nearly all "beginners" make the mistake of taking the largest pots they can find. They think, I suppose, of the plants in the open ground as having unlimited room, and thence infer that the larger the pot-room the better. But they quite overlook certain other facts. Plants need air for their roots as well as water. In the open ground they send their roots along near the surface,

or deeper into the soil, according to their need, while they have the benefit of the hoeing, or the operation of natural agencies, in loosening and ventilating the soil. In pots not too large they send their roots by the very shortest line to the inside surface, where, if the pot is porous, there is always the needful supply of air. But what chance of obtaining air have the roots of a small plant in a large pot or tub set up in the house? So you see "circumstances alter cases," and the facts of out-door culture really favor the in-door use of the smaller pots.

But the rule is amply supported by actual experiments, as well as by the philosophy of the case. When a florist has a sickly plant, choice enough to claim his special care, he puts it into a hospital, or sanitarium, by changing it to the smallest pot possible, and there it generally recovers. Even healthy plants show a remarkable difference of growth between the two conditions. I have before me now, in a large pot with other plants, but not crowded by them, an ivy two years old and *five inches high.* Another of the same kind and age, has been growing in a small pot, changed occasionally for the next size larger, until now it has a length of *ten or twelve feet* with lateral branches. In nearly every case where I have heard complaints that plants would not grow, and have sought out the cause, I have found some victim of suffocation. So far as my experience goes, there is no surer way of checking the growth of any plant kept in the house, than to put it into a pot so large that the roots can not easily reach its sides.

5. To pot a plant properly, have the soil moist, but not *wet,* the roots naturally extended, and the stem in about its previous position at the surface. Pack more or less closely as the plant is hard or soft-stemmed; but ordinarily trust to the settling effect of a smart rap or two, a slight pressure with the thumbs, and a thorough watering. Leave from half an inch to an inch of pot-room

above the soil for the reception of water. In re-potting, set the ball in the center with soil enough at the bottom to bring it to the proper height, and carefully fill the sides. If the roots are very thickly matted, a gentle pressure of the ball between the hands will loosen them sufficiently.

6. This re-potting consists, as you see, not in the removal of the soil in which the plants have been growing, except in rare cases when it has become soured or filled with worms, but simply in the addition of fresh soil around the ball in a somewhat larger pot. I mention this, because I have recently heard of a lady who thought she must give her plants entirely fresh soil every three or four months. She did so, and then mourned and wondered over their untimely demise. But probably you have had better instructions.

7. Change the pot of a healthy plant only when the roots begin to form a mat around the outside of the ball, and then take the next size larger. Ordinarily, the difference of diameter should not be more than an inch, and sometimes a half inch is better. I am told that when florists wish to secure an extraordinary growth, say of a Fuchsia for exhibition, they do this work of re-potting frequently, but with the smallest differences of size. Each shifting, you know, brings fresh new soil to the plant, and puts it at just the right place, near the ventilating pores of the pot.

8. When a plant is to remain for years in the same place, so that re-potting would be difficult, as in the case of an Ivy trained over a frame-work, it may be put at once into a sufficiently large pot; but let it be near one side, rather than at the center. Should fresh soil be needed after a year or two, put it in place of so much old soil removed carefully from the top. I have a flourishing Ivy which has remained in the same eight-inch pot, with but little other change than this, for ten years. Once in this

time, four or five years ago, it received a severe "cutting back" and a renewal of about two-thirds of the soil; and now I hardly know where to find place for its enormous growth.

9. Soak new pots in water until well saturated, and never use an old one without first giving it a thorough cleansing.

10. For the purpose of drainage, with the small pots I have advised, it will not be necessary to "fill the bottoms with bits of charcoal and pottery," as is often recommended. A piece of broken pot laid over the hole in the bottom will prevent the soil from falling through without hindering drainage there, and the porous sides of the pot will do the rest.

11. Protect the sides of pots from the full blaze of sunshine by some sort of covering, natural or artificial. The heat of the direct rays is sometimes so intense, even in winter, as almost to parboil the roots which lie exposed against the sides. At the top the soil affords protection, but even this may occasionally need a "mulching" of moss.

12. If you wish to group together several plants, as in a large vase or hanging-basket, the best way for your greeneries is to set them in *with the pots*, and fill the interspaces with sand or moss. Thus any pot can be easily lifted out for examination, or replaced by another; and, for reasons already given, the plants are much more likely to flourish, than when embedded together in the usual way. In my first winter's experiments, I lost several choice plants by following the fashion, and so have learned the value of the pots.

"But when shall we give the rain? How often and how much?"

Very perplexing questions these, and it is well that we have not to determine them for "all out-doors." But

here the responsibility is ours, and we must meet it as best we can. Let us then seek for wisdom in

REGULATING THE RAIN.

1. In a state of rest—that is, when not growing—plants require but a comparatively small quantity of water, only just enough to supply the waste by evaporation from their leaves, and to keep a moist atmosphere around their roots. Without such an atmosphere in the soil, the absorbent surface of their roots will dry up and wither. On the other hand, if crowded with water, it will become clogged and rot away. The danger of such clogging is of course greatest, when the water, or dissolved food, is not drawn up into the plant; and that is always the case in a state of rest. So be sparing then of your rain; and if the plant is entirely dormant in the cellar, give no more than enough to keep the soil from becoming "powder-dry."

2. Growing plants need water, not only to supply the waste by evaporation, but to carry the food that helps to build them up. So they must have a larger quantity, and are in much less danger from overwatering. As you will observe, the soil of such plants dries out much more rapidly than that of resting plants—a fact which shows their larger demand. It is safe, therefore, to regulate the watering by the condition of the plant as growing or not growing, increasing the supply *gradually with the growth.*

3. Their natural habits also must be consulted. For instance, the Calla Lily is constituted to flourish in wet places, and may even be set into an aquarium; though, like other plants, on ceasing to grow it requires the water to be gradually withdrawn. At the other extreme are plants like the various kinds of Cactus, which have come to us from a dry and sandy habitat, and are able to endure a protracted drouth.

4. Special care should be taken where the roots are very fine and delicate, like those of Carnations and Geraniums. Such plants, even in the open ground, must have the best drainage, and are often injured by excessive rains. So you will need to become acquainted with the character of the roots as they appear on the outside of the ball, and act accordingly.

5. Light and heat are further very important regulating conditions. They not only cause evaporation, but stimulate action in the plant. Just in proportion, therefore, as they increase, should the supply of water be increased, and *vice versa.* Remember this in any long spell of cold and cloudy weather, and especially during the very "cold snaps" of winter, when you find it difficult to keep your rooms at even a moderate temperature. *Be sparing of water then, and you will avoid one of the most common causes of injury to house plants in winter time.*

6. The best hour of the day for watering, especially in cold weather, is the early morning, when the heat of the room is to be increased, and will counteract the cooling effect. Near the beginning and close of winter, when the sunshine is abundant, evening may be preferable. You will not be likely to select the sunniest part of the day, if you follow copy, since it is generally cloudy when it rains.

7. The temperature of the water should not be lower than that of the room, and in cold weather it may better be as high as blood heat, if not higher. It is said that even 120° may be allowed occasionally with benefit, especially if the plants are not thrifty, or the soil has become sour. In greenhouses, with the heat under the benches, little or no attention is paid to the temperature of the water; but your windows are the coldest places in the room, and the plants may well have a little warming in the watering. The warm rains of spring and summer,

with their marvelous effects, afford all the warrant needed for the practice.

8. The size of the pot has something to do with the frequency of watering. Small pots, of course, dry out much more rapidly than large ones. When the latter seem dry at the top, they may have moisture enough deeper within; but not so with the former, since they have but little depth. The small pots may, therefore, claim the extra showers without danger of drowning.

9. The actual condition of the soil may be easily determined by the appearance of the surface as light or dark, or by the sense of touch when the finger is pressed in at the top, or by "hefting" the pot, which always seems lighter when dry. A little practice will make you expert in thus detecting the need of water.

10. *Never water any ordinary plant when it is already wet.* Let it become a little thirsty, at least, but not so faint as to droop its leaves. There should be such intervals between one watering and another as to allow some change or difference in the degrees of moisture. If plants need to breathe as well as drink, they will thus have a chance. It seems very certain that they can not do both at the same time, and if kept continually saturated, they are likely to die of sheer suffocation.

11. When the time comes for watering, *do it thoroughly*, so as to reach every part of the ball. If the water runs through into the saucer, and is not soon soaked up, it should ordinarily be poured off. For a while after such a soaking rain, give only a slight sprinkle, or a little dew, now and then, if the leaves will bear it, but by all means avoid a perpetual drizzle.

So now, with this shower of words—I leave the rest for another time, and give *you* proper treatment by a pause.

CHAPTER V.

PROPER TREATMENT.—CONTINUED.

HEAT, LIGHT, AND AIR.—PROTECTION AND RESCUE.—INSECTS.—INANIMATE DUST.—WORMS.—DISEASE AND DECLINE.—FROZEN PLANTS.

HAVE you, in the pause of the letters, made any progress in mastering the problem of the rain? If so, I congratulate you; for a difficult problem it is, and well worth the mastering. The rain, however, is only one part of the weather, outside or inside. For our plants we are quite as much concerned in regarding, and to a considerable extent adjusting, the conditions of

HEAT, LIGHT, AND AIR.

In the arrangements of "the New Eden," we have already made provision for sufficient heat and ventilation, and for all the light possible, giving special attention to the place and its accommodations; so we now have to consider only the questions of their use in the proper treatment of the plants.

1. Very tender plants like the Coleuses and Begonias should be brought into the house early in the autumn, as soon as the nights begin to be somewhat chilly, and afterward the more hardy. All alike should have the opportunity of becoming gradually accustomed to their new

quarters, by being exposed in the open window or outdoors during the warm daytime, and brought in at night.

2. All sudden and extreme changes of heat and light, together with strong direct drafts of air, should be carefully avoided. Some plants will endure considerable variations of temperature for a short time without injury, but for all, without exception, something like the uniformity of summer is desirable.

3. On the bright, sunshiny days of winter, the heat of your rooms should be much higher—say about 10°—than when the weather is cloudy and dark. Plants seem to require light and heat in very even proportions. In summer, their natural time of growth, this requirement is met, the heat being greatest when light is most abundant; but in the artificial conditions of winter, it remains for us to supply the part that is lacking, and to do so after the model of nature.

As to the necessity of maintaining this equilibrium of light and heat, there can be no doubt. It is said, on good authority, that is, by persons who have made the experiment, that a plant which keeps safely in a dark cellar with the thermometer at 40°, soon dies if the heat is raised by a furnace without a corresponding increase of light. Let the sunshine fall upon the same plant in a room having not more than 40°, and the effect is similar. In short, if we are to have any real summer at all in our rooms, we must have all of its natural parts in natural proportions.

4. At night, also, the same natural order should be observed; that is to say, the heat and light should be diminished together. If your rooms are occupied during the long evenings, give the plants the coolest place, and screen them as much as possible from whatever light you use, especially from brilliant gas-light. When you finally put them to rest in complete darkness, let it be, as I have

once before said, at a temperature several degrees lower than that of the day.

5. The difference of temperature between the floor and the ceiling has been already referred to. Take advantage of this, so far as you can, in the arrangement of your plants. For example, give the lower and cooler places to Stevias, Geraniums, Hyacinths, etc., and the higher to plants like the Begonias.

6. The leaves of plants, you know, always turn their upper surface directly to the light, so as to receive it at nearly right angles. Unless they are left free to do so, they almost invariably die. This fact shows plainly enough their constant need of such a position. It can not, therefore, be good treatment to turn them away from the light as soon as they have reached it, and thus compel them to be always seeking without receiving what they need. It is true that, if allowed to remain in the same position, in a side light, many plants will lose their symmetry of form, but this is one of the difficulties of plant-culture in windows. To a considerable extent, however, it may be obviated by setting the arborescent or tree-like plants *close to the window at the bottom, and turning them every day*, so that all sides may receive as equally as possible their daily rations of sunlight. As the vines do not suffer so much in appearance from one-sidedness, they should be set farther back from the window, and *never turned at all.* Their leaves all pointing in one direction, and always looking out to the sky, may seem a little odd at first, but you will soon come to like it, and perhaps find in it a *pointed* lesson on "seeking the light."

7. Every day, except in the very coldest weather, admit fresh air to your rooms, directly from the outside, even if it be for only a few moments. This can generally be done with safety by opening a window at a little distance from the plants; otherwise, open the doors into

adjoining rooms. Especially take advantage of the occasional moderation of winter weather, the thaws and warm spells that frequently occur in our latitude. As a rule, give your plants all the fresh air it is possible to give them without violating other equally important rules.

8. On very cold days, when your rooms can not be freely ventilated, and there is little evaporation from the pots, relieve the excessive dryness of the air by keeping water in an open vessel where it may slowly evaporate, or by watering the sand or moss around the pots. If you can not have the atmosphere fully moist enough for your plants, let it be at least healthfully so for yourselves.

Now, if you were not interested, you might well be wearied with this long enumeration of particulars; and yet I have said nothing on the specific treatment of plants for *winter blooming*. If your windows are favorable for that, and you are ready for the extra labor required, I must take up the subject in another letter; but you will understand that all the treatment here prescribed may be quite as necessary for winter bloomers as for other plants. So I proceed with the particulars; and not least in importance is the matter of

PROTECTION AND RESCUE FROM INSECTS, ETC.

1. *From insects.*—Keep a sharp look-out, and wage upon them a war of absolute extermination. If they once gain possession, great is their multitude, and great their devastation.

The tiny *Red Spider* is perhaps the worst enemy, because it is so nearly invisible, and so very persistent. It delights in the dry heat of your rooms, and finds a home on the leaves of almost any plant. Where it comes from, nobody can tell, but its presence is soon announced by its ravages. If you have never seen one, you may at first require the aid of a magnifying glass. When minute specks appear on the lower side of a leaf, put it under

the lens, and you will probably discover the pest, which will appear, when magnified, as in fig. 8. Their mischief is often wrought before their presence is even suspected, and without doubt they are the real but mysterious cause of numerous failures.

The *Aphides*, or green plant-lice, you have often seen on the tender shoots of rose bushes in summer time. They are very wonderful creatures and well worth studying, as you will find when you become interested in entomology. But they are much less to be dreaded than the spider, because more easily seen and removed.

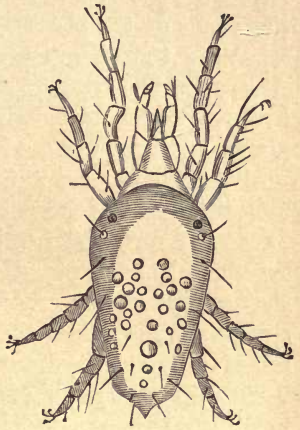


Fig. 8.—RED SPIDER, MAGNIFIED.

The *Mealy-bug* is not so likely to trouble you as the other insects mentioned. But if you chance to find on the leaves, near their axils, any white or grayish spots resembling bits of mould, put them under the microscope, and you will at once understand the necessity of keeping them off from your plants. In the same way examine anything having a suspicious appearance, and you will perhaps detect some kind of depredating guest which needs to be ousted at once, even though it be only the quiet-looking *Brown-scale* on the lower side of some shaded ivy leaf.

For protection or relief, the means commonly employed in greenhouses is dense and stifling tobacco smoke, or, in some cases, a strong infusion or tea of tobacco applied with a syringe. Twice a week generally suffices for the Aphides, at least; and a constantly moist atmosphere is the safeguard against the Red Spiders. In your rooms,

the smoking process is out of the question, though it might be used somewhere outside under an inverted barrel. But for the few plants in your keeping, you may better depend upon the prompt and thorough use of a sponge or brush with soap and water. In the case of Red Spiders, drowning will perhaps be more convenient. Invert the pot over the edge of a well filled tub, and keep the stems of the plant entirely submerged for an hour, repeating the operation after a day or two, if necessary. A very forcible application of water from a syringe or a hydrant would of course be more effectual. My own plants thus have a share in the benefits of the City water-works. Such as are movable, I take occasionally to the bath-tub, and give them the spray from a hose attached to the hydrant, and furnished with a rose nozzle. This spray may be made a gentle shower, or a miniature tempest that sweeps away every vestige of insect life. In warm spring weather, when the Red Spiders are most troublesome, an outside hydrant or a gardener's syringe may be used with the same effect. On the whole, the most healthy plants are the least likely to be infested with parasites of any kind—another reason for keeping them healthy.

2. *Inanimate dust* is less injurious than the insects, but nevertheless you will insist upon its removal. Here again the sponge comes into requisition, and it should be applied to the lower as well as the upper side of the leaves, keeping them thoroughly clean. Sometimes it will be sufficient to "raise the wind" and blow off the dust, or to use the feather-end of a quill as a brush. If your plants are kept in a "garden-box," such as I have referred to heretofore, take a small syringe or a rose-sprinkler and give them occasionally a brisk little shower —a natural method, you know, of removing dust.

3. *Worms* in the soil are not likely to cause you much trouble. Angle-worms, which only *disturb* the roots,

may be easily picked from the outside of the ball, if you have nimble fingers, or expelled by saturating the soil with clear lime-water. If other worms appear, it may be necessary to shake out the roots and give them entirely new soil.

DISEASE OR DECLINE.

This unfortunate condition of plants needs no description for you, after a whole winter's care of "invalids." You are already only too familiar with its infallible signs, the dropping of the leaves, or their turning from the healthy green to the sickly yellowish or white. In general it is the result either of disagreement between the plant and the place, or of the neglect of some one or more of the foregoing rules of treatment. In the latter case, of course "an ounce of prevention is worth a pound of cure." But with your utmost care, you will be likely to have more or less occasion for the use of a restorative treatment. The most common *causes and remedies*—besides the three just mentioned—may be briefly summed up as follows :

1. Too much water. The roots either lose their fresh appearance, or do not appear at all on the sides of the ball ; then, if the over-watering is continued, they begin to decay and the soil becomes sour. In the first stage, remove the cause ; that is to say, give less water and see that the drainage outlet is open. In the second stage, shake out the roots clean from the soil, remove decayed parts with a sharp knife, rinse carefully in tepid water, give fresh soil in a small pot, cut back the branches somewhat, and water sparingly until new growth appears.

2. Too little water, except on or near the surface—the ball hard and dry, and the roots withering. Soak in tepid water half an hour, and, in extreme cases, treat as directed in the *second* stage of over-watering.

3. Sunshine too much, or not enough, for the nature

and habits of the plants. Too much is quite possible with Ferns, Lycopodiums, and the like, which should be kept from direct sunlight except for a short time in the morning. Not enough is much the more common difficulty, especially in winter. Suit the plants if possible.

4. Too low a temperature—to be suspected in the case of tropical plants. Remedy, less water or more heat.

5. Lack of nutriment—roots over-crowded and matted around the ball. Shift to a larger pot, or, if this cannot be done conveniently, water with the liquid fertilizer [See Chap. VI., Winter Bloom, page 76], or add fresh soil at the top.

6. Bad potting by using too large a pot, or by setting the plant unnaturally deep in the soil, or by giving it a soil entirely unsuitable. To be made better speedily.

7. Sudden change of temperature by drafts of cold air, causing mildew on leaves, especially with Roses. Partial, if not entire relief, from mildew may be obtained by washing or wetting the leaves and sprinkling them with Flowers of Sulphur from a pepper-box, and allowing it to remain a few days.

Do not wait for any diseased condition to become established. When a plant begins to "complain" in any way, endeavor, like a mother with her child, to find out the cause and apply the remedy. A yellow leaf appears, now and then, on a plant otherwise healthy, but even so slight a symptom should not pass entirely unheeded ; and any decided premonition of decline should receive prompt and thorough attention. Turn out the ball and examine the roots. Think over the past treatment of the plant as compared with the directions here given, and make any change which seems to be required. If individual investigation and experiment do not prove successful, summon your whole company as a "council of doctors," consult the wisdom of the books, leave no means untried for the relief of the patient. Then if death comes, you

will have the consolation of having done all you could to avert it. Plants, like people, sometimes die under what seems to be the best of treatment, but they are often ill and recover.

FROZEN PLANTS.

Such plants I hope you will never have occasion to treat. You remember that in the arrangements of our Eden, we have taken every precaution against freezing, by having a continuous heat, by drawing the plants back from the windows on severely cold nights, or lifting them up from the floor, or covering them closely with paper. And so I hope that you may escape the touch of frost, as I have hitherto. But it is well to know what to do in any possible emergency.

I have seen it reported of a lady, somewhere, that she "has saved her plants when frozen hard by leaving them to dry in a perfectly dark cellar for three days," and has found it much better than "showering with cold water." If the plants thus treated "never lost a leaf," as alleged, they must have been of some hardy varieties or in a state of comparative rest. Professional florists generally agree that exclusion from the light is quite unnecessary, if not a positive disadvantage. The one thing on which they earnestly insist, is an *upward change of temperature, immediate but gradual, or not for some time extreme.* This was probably the real benefit of the cellar, and is the common effect of sprinkling with cool water. Although no guarantee can be given of recovery in all cases, there may be a chance in apparently the worst. As frozen plants are brittle, they should be handled with care.

Now, it is quite probable that some item of "greenery" management has been overlooked or slighted; but all of the most important, I think, have been duly set before you. Though they present, at the first glance, a rather

formidable array of things to be done, in doing them with your aptitude and skill, you will soon master all difficulties, and find in success the most ample reward. The plants which exhibit so sorry a spectacle under ill-usage, are just as capable of showing a gladsome appreciation of the proper treatment.

SAXIFRAGA SARMENTOSA.

CHAPTER VI.

WINTER BLOOM.

THE "BLOOMERS."—SPECIAL TREATMENT.—LIQUID FERTILIZERS.—CARE OF THE FLOWERS.

AVERY neat note comes from the young florists, and the fragrance of its thanks is more delicate and grateful than that of nature's choicest bloom. But especially welcome is the intelligence it brings that some of your rooms have a southern or southeastern exposure—the very best for winter. In the sunshine thus afforded you may put the *crown of flowers* upon the beauty of your "greenerics." So I do not wonder that you ask for a letter, "long or short," on the management of plants for winter blooming—"just to tell us the *whats and the hows.*" But please bear in mind that I can give you now, as heretofore, only lessons in the primary department.

THE "BLOOMERS"

—among the flowers, of course—in color, not costume. You have observed, I presume, that not all plants grant the favor of winter bloom. In every case, flowering is the plant's climax, its crowning achievement and consummate result. After its accomplishment, many plants seem to have nothing more to live for, and accordingly die at an age of only one year, or of two years at most.

Even many of the perennials require the light and heat of summer for their greatest work, and when it is done, they insist upon having a long period of rest and recuperation. But, happily for us, some rare specimens seem to be endowed with a genius for blooming. After due preparation, they give us their flowers even in winter time, not only in greenhouses, but under the less favorable circumstances of our rooms, requiring only the sunshine's potent aid; and they continue flowering with astonishing persistency, according to the amount of their natural vigor, or so long as they continue to grow. Of course, such plants are specially worthy of your acquaintance. Let me introduce a few.

ROSES, by common consent, must lead the floral train; and here they come from the most remote quarters of the globe—from Japan, China, Bengal, the south of Europe, etc. If they have stopped on the way, it has been with some hospitable florist, for the purpose of taking new roots from "cuttings" of their twigs, thus to multiply their number for the million of such as you. Strangely enough, they join the march of modern civilization, and travel by express or by post on the fastest trains of the railways, as if in haste to receive your greetings. What a magnificent titled company they are—Dukes and Duchesses, Princes and Princesses, almost without number! And their apparel—well, I leave the description to you; but I am very sure that if they have not been in league with the rainbow and borrowed its hues, they have been like the rainbow in the splendors of the sun. And yet, with all this royal display of titles and robes, they wait to become your most gracious guests and faithful friends.

As to the select particular few whom your rooms can well accommodate during the winter, I am furnished with their cards, which I here present:

Louis Phillippe, from China or Bengal, bright crimson; a profuse bloomer.

Agrippina, Bengal, deep crimson, double; in common use for windows.

Duchesse de Brabant, Tea-scented, light carmine shade; blooms abundantly.

Bon Silene, Tea, large buds, deep salmon shade of pink; very beautiful.

Safrano, Tea, bud rose, rich color of apricot and orange yellow; fragrant, free-grower.

Pactole, Tea, small, light canary yellow; grows rapidly, and blooms profusely.

Phœnix, Bourbon, light rosy purple, large flower, and fine form of bush.

Hermosa, Bourbon, clear rose color, very fragrant, and free blooming; a common favorite.

CARNATIONS are worthy rivals of the Rose, or attendants, let us rather say. No jealousies are found among the *flowers,* you know. Each has its own style of beauty, which is only heightened in effect by comparison, or by contrast to that of others. Each also sends forth upon the air its own peculiar fragrance, sweet as the breath of spices or incense rising from altars of worship. Not singly and alone, but in happy train together, they wait to lead us through the weeks and months of winter; and not least in all the train are the Monthly Carnations, whose summer lasts through all the year. Let me introduce:

President De Graw, pure and spotless white, as a President should always be.

Edwardsii, the *protegè* and namesake of some florist, I suppose; the flowers large, and pure white.

To the sight, these may seem a little cold, but their breath is warm and spicy, and they are not to stand alone in their snowy whiteness. Here are others fairly blazing with color:

La Puritè, arrayed in ample robes of deepest carmine; very choice.

Vaillant, bright scarlet, small, profusely blooming.

De Fontaine, petals of yellow ground, edged with scarlet, white, and crimson.

Other varieties might be mentioned, but these are probably more than you will need. Each member of the group is a winter favorite with the florists, and is well commended to your care.

I make such "honorable mention" of Roses and Carnations, not only for their superior beauty, but because of their actual service in my behalf. During two winters, when my study had a southeastern exposure, they bloomed abundantly under the very serious disadvantage of a gas-light burning half the night. This was a favor to me which has made them all the more my favorites. I had not ventured to hope for much in a condition so unnatural for plants; and when the first Rose opened its petals and diffused its fragrance, in the midst of one of the fiercest snow-storms of the winter, it seemed a sufficient compensation for all the care bestowed. But afterwards the flowers became more numerous than the storms, and fully established the success of the experiment. Of course, they may be expected to do quite as well with you under better circumstances.

As the habits of the study could not well be changed, the variety of flowering plants then submitted to trial was small, and the results were not all alike. A *Fuchsia speciosa*, said to be one of the best for winter flowering, put forth vigorous shoots, but dropped nearly all its buds, affected doubtless by the gas. A fine, healthy *Passiflora cærulea* opened one of its wonderful flowers near the beginning of winter, and thereafter had "nothing but leaves." A few others gave more or less of bloom, namely, the *Primula Sinensis*, *Begonia manicata*, *B. Weltoniensis*, *Linaria Cymbalaria*, *Stevia compacta*, Calla, and Lily of the Valley.

Presuming that your rooms have a more favorable con-

dition at night, and a temperature of 45° or 50° —rising to 60° or 70° during the day—I mention a few more of such winter-blooming plants as have a good "window reputation" among amateurs and professional florists: Azaleas; *Astilbe Japonica;* Catalonian Jessamine; *Centradenias* (in a Wardian case); *Cuphea,* or Cigar plant; *Cyclamen Persicum; Cytisus racemosus;* Daphnes; *Dicentra spectabilis;* Geraniums, of all varieties; Laurustinus (rather too large); *Libonia floribunda;* Lobelias, for a north or east window; *Mahernia odorata* (or *verticillata*), and all the hardy bulbs, Hyacinth, Tulip, Crocus, Narcissus, etc.

Some of the plants which are easily forced into bloom by the florists are hardly desirable for your rooms, because of the difficulty of supplying the needed conditions, or for other sufficient reasons, such as unwieldiness, inferiority of flowers, etc. Camellias require considerable skill in management, and Bouvardias, Tuberoses, and Heliotropes a rather unhealthful degree of heat. But if you have an outdoor summer garden well stocked with common "bedding plants," you may draw upon them *ad libitum.* With a little preparation, a few of these will furnish you with abundant bloom through all the late autumn, if not through the winter; but more of this further along.

SPECIAL TREATMENT.

You will not allow yourselves to be misled by the word "monthly," as if Monthly Roses and Monthly Carnations could go on blooming year in and year out, until they die of old age. Even these vigorous bloomers require, like other plants, some season of comparative rest; and if they do not have it in winter, they must in summer. In this fact we have the simple explanation of what is called the "preparation" of winter-blooming plants. It consists merely in giving them their rest in

summer, and helping them in every possible way to store up vigor for their work in winter. Without such preparation in some degree, it is vain to expect any satisfactory success. But you will probably need a few directions rather more explicit and in detail.

1. *Roses*, in unskilled hands, are likely to suffer by transplanting. You will, therefore, find it better to cultivate them only in pots. These should be plunged to the rim in the open ground as early as possible after danger of injury from frost, and be kept there throughout the summer. To prevent the roots from passing through the hole in the bottom of the pot, cover it closely with a flat stone. If flower-buds appear, pinch them off, but otherwise let the plants take their own course, giving them only such care as may be needful for their health—good drainage in a wet season, water in time of drouth, etc. In August or September, shift them to pots one size larger, and return them to their places in the open ground. This gives them an opportunity to form the strong "working roots" on which their winter growth depends. Allow them to remain as late as is possible with safety, or until their leaves begin to drop under the first frosts of autumn. Then remove them to a partially lighted cellar, free from frost, to be kept in a dormant state, until needed for your rooms, giving water only enough for a moist atmosphere around the roots, but *never allowing them to become dry.*

About eight weeks before the time when you desire their bloom, bring the plants from the cellar, and give them a thorough "cutting back"—say from one-fourth to one-half—so as to secure a new growth of strong bud-bearing shoots. Put them in the coolest place in the room for three or four days, and then in the full sunlight of the window. At the same time gradually increase the supply of water, but be rather sparing until the new growth is well begun. If you desire flowers at the begin-

ning of winter, you must, of course, bring some of the plants directly to your rooms earlier in the season, having cut them back at the time of repotting, and not allowing them to become dormant. Afterward, in order to keep up the succession, bring others from the cellar at intervals of one or two weeks, allowing, as I have said, about eight weeks for the formation of the new flowering growth. Thus you may have Roses constantly in bloom until the flowers of spring return.

When any of the plants cease to grow, diminish their supply of water, and return them to the cellar, or retain them in place, as may be most convenient, until the time for putting them out in the spring. Then, if they seem to be very much exhausted or sickly—and only in such case—shake out the roots from the soil, cut off such as are dried and black, give fresh soil in smaller pots, and after shading from the sun for a few days, plunge them as before in the garden beds. Probably the most of them will need only this change to the open air.

2. *Carnations* are less liable to injury from frost than tender Roses, and may, therefore, go outside much earlier in spring, "as soon as the earliest garden vegetables;" and I think you might venture to take them from the pots and plant them out, but be careful to select a deep, rich soil, well drained. Young plants are to be preferred, and if taken from cuttings or layers as late as April or May, they will become sufficiently large for your purpose by winter. During their summer growth, remove the flower-buds, and cut back all straggling stems so as to give the plants a compact and bushy form. Early in September, carefully transfer them from the garden-bed to pots of moderate size, with rich soil, and keep the pots plunged in the ground until you take them late in the season directly to your rooms.

3. *Callas* are rather too large for a crowded window, excepting, perhaps, the new dwarf variety, but in other

respects they are very desirable. When set in the center of the window-box, or in vases on the floor, they produce a fine effect, the leaves being large and graceful, and the pure white flowers remaining beautiful for several weeks. Both varieties are said to thrive in rooms having but little direct sunshine, and are anywhere easily managed. After they have flowered, whether in winter or spring, remove them to the cellar, or some sheltered place free from frost, and, without breaking the stalks, turn the pots upon their sides, and allow the roots to become very nearly dry. In August, soak the ball in water, wash off all the soil, remove the offsets (to be used for new plants), and repot the tuberous roots in a rich soil of clayey loam. From this time until the next period of rest, water abundantly every day. In this case, there is, happily, no liability to injury from over-watering, as the Calla is naturally an aquatic plant, and is often used for aquariums, where it grows with the roots constantly submerged. I have seen it reported, that with strong plants a second flower may be brought forward immediately after the first has faded, by pulling down and cutting away the old stalk, at the foot of which a new bud appears. You may be interested in making the experiment.

4. The hardy or "Holland Bulbs"—*Hyacinths, Narcissus,* etc.—are, as you probably know, the common resort for winter bloom when everything else has been given up in despair. They are doubtless the best plants that can be selected for a cool room with windows to the north. Indeed, the beauty of their flowers is more or less impaired by exposure to a high temperature and strong sunshine. As they have a great variety of colors and are so easily accommodated, you will expect from me "the whats and the hows" of their special treatment.

Hyacinths may be grown in wet sand, or gravel, or moss, or in water, but much better in pots of earth not less than six inches deep. In a pot eight inches deep

and wide, several may be brought together—say three of different colors. The single-flowered varieties are, in some respects, better than the double. For the soil, take a *sandy* loam, with one-third of well-rotted manure. For a succession of flowers through the winter, do the potting with intervals of a week or two, or pot all the bulbs at once and bring them to the light at different times. Set the bulb so as to leave about half of it above the soil when pressed down, and nearly an inch between the surface of the soil and the rim of the pot. After saturating thoroughly with water, take the pots to a dark cellar, or cover them out-doors with anything which will, without injuring the buds, effectually exclude light and heat—this being the condition necessary for the process of rooting. If the roots are found in the bottom of the pots at the end of six or eight weeks—the time ordinarily required—the plants are ready to grow upward and may be taken at once to the light. Another month will probably suffice for the appearance of the flowers. As the growth advances, water freely, but not to the extent of soaking. When the flowers fade, cut away the stalks, but let the leaves grow until they turn yellow, when you may allow the bulbs gradually to become entirely dry. Another season they may be forced into bloom the same way, but with less satisfactory results, and they may better be used in the outside garden.

When two or more bulbs are to be flowered in the same pot, it is important that they come into bloom together. To make sure of this, all the bulbs that are to be used in this manner are sometimes set out in a box of sandy earth, and this box kept in the dark and treated just as directed for pots containing a single bulb. When the bulbs have formed abundant roots, those may be selected that are equally advanced as to bud, and carefully potted.

Their cultivation in glasses is not to be commended, for the bulbs become quite worthless afterward, and the

flowers can hardly be as perfect as by the more natural process; but perhaps you will like to try it for the sake of variety, if not of fashion. Select colored glasses, keep the water barely in contact with the bottom of the bulb, changing it occasionally, and let the rooting be done in some dark and cool place. Or, first root the bulbs in clean sand in the manner described for pot culture, and then, having washed the sand from the roots, transfer them to the glass. For another experiment, nearly fill a glass-jar or other dish with clean pebbles, set the bulb on the top, pour in water, and give the same treatment as with the ordinary glass. A few drops of Hartshorn (the *Aqua Ammoniæ* of the druggist), or other liquid fertilizer, added to the water, will be of some advantage. Hyacinths will grow and bloom even in moss closely packed in a vase or hanging-basket and kept sufficiently wet. As in all these cases, the generous bulb must take the place of soil in supplying the capital required, do you wonder that it is soon forced into bankruptcy?

The other Holland Bulbs require the same kind of soil, the same preparatory process of rooting, and the same general conditions and treatment as the Hyacinth. They need, however, much less pot-room, varying somewhat with the kinds. For example, into a pot six inches in diameter and depth, may be put three of the *Polyanthus Narcissus*, or five of the *Von Thol* Tulips, or eight or ten *Crocuses*. After flowering, the supply of water should be somewhat diminished, but not entirely withdrawn until the leaves have had time to ripen. Then the bulbs may be dried off and removed from the pots; but the Narcissus and Crocus are said to do better if plunged in the garden-beds, and allowed to remain in the same pots for two or three years, or until they have become so crowded as to need dividing and repotting. The *Polyanthus Narcissus* is perhaps equal to the Hyacinth in value for winter-blooming, and is certainly preferable to the more

hardy and common Daffodil and Jonquil. Of the Tulips only a few kinds are recommended as suitable, among which are the *Duc Von Thol*, and the *Tournesol*. All these bulbous plants have so many varieties in the form and coloring of the flowers, as to leave you the largest liberty of choice.

5. *Lilies of the Valley—Convallaria majalis*—have so many excellent qualities as to be well worthy the honor of winter-bloom. As they are hardy perennials, having a place in many common gardens, where their roots are rapidly extended, it is necessary only to transfer them in clumps to pots of any size desired. If, however, you must obtain them in their marketable form as "crowns" or "pips," select only the strongest, put half a dozen in a six-inch pot, and allow a month for the roots to form. Strange to say, "several severe freezes" are recommended as an important, if not necessary, part of the "preparation." So you may safely leave the pots in *any* accessible place, and take them to your rooms in succession, or as desired through the winter. They need but little direct sunshine, that of the morning being the best. In the spring, plant them out in a shady garden-bed, and after two or three years they may be taken again for winter use.

6. *Azaleas*—white, rose-colored, and red—are shrubby greenhouse perennials which grow in beauty with the years. They need a light soil of sandy loam with *one-third or one-half of leaf-mould* from the woods. In May, they should be repotted without disturbing the roots, trimmed only enough to keep them in good shape, and then "plunged" in some partly shaded place in the garden. In September, they should be brought under cover; and as cold weather approaches, they may be put at once in the room, or stored in the cellar to be kept dormant like Roses, and taken to the window for flowering in succession from February to May.

7. The *Daphne-odora*, a sweet-scented winter-flowering shrub, continues serviceable for years, and is said to be one of the best for your purpose. Take a small plant and keep it in good shape by thorough pruning. Repot it in May and leave it out doors during the summer. In September let it have more sunshine, and before the first frost appears take it directly to your room. It thrives best at a very moderate temperature, and blooms more or less from December to March.

8. The *Fuchsia speciosa* may be cultivated in pots during the summer, or lifted from the ground and potted with very rich soil in September, brought under cover early in October, and afterward treated like the Rose, except that it requires less sunshine. A room without gas and with an eastern exposure is doubtless the most favorable.

9. *Abutilon, "Boule de Niege."*—This, as its name, "Snowball Abutilon," indicates, is a white-flowered variety of Abutilon, one species of which, from the form of its leaves, is well known as the "Flowering Maple." There can hardly be a more accommodating plant than this *Boule de Niege*, as little plants only six inches high will give some flowers, and when as many feet tall, it will yield a profusion. A friend writes, "It comes as near being a perpetual flower, as any plant I know of; after flowering in the house all winter, it may be turned into the open ground, where it will produce its white, bell-shaped flowers until it is time to bring it in again. It may be pruned into any desirable shape; I grow it with a head upon a naked stem, three feet high, so that it may stand well above other plants."

10. *Chinese Primroses.*—Of these, there are single and double, and in colors from pure white to dark purple or magenta; in some, the flowers are handsomely fringed, and the leaves also present much variety. They may be propagated by cuttings made from the short side-shoots

of old plants, and they may also be raised from seeds. With seeds from a good "strain," as the gardeners say, *i. e.*, saved from choice and desirable flowers, you may possibly raise a new and superior variety. The seeds are very minute, and need to be merely pressed into the soil; lay a piece of porous paper over the surface, and *water the paper;* this will keep the seeds from being washed away. It takes about three weeks for them to germinate; when the little plants begin to appear, remove the paper, and after that, water as gently as possible. When large enough to handle, each little primrose must be put in a little pot by itself, to be followed by a larger one when the plant needs it. Seeds sown in June and July, will give plants that will flower the next winter. But instead of caring for the young seedlings you may prefer to get plants ready grown from the florist—indeed this is the only way to be sure of double ones, or of any particular variety; in this case, be sure and get them early in the fall, before they have been exposed to the warm and moist atmosphere of the greenhouse, and it will be all the better if the flower cluster has not begun to push upwards at all. If plants that have been forced until they are nearly ready to flower, are taken to your greenery, they will show their dislike of the change by refusing to bloom at all, but if placed at the window before they have been pampered, they will flower freely.

All the plants best adapted to winter-flowering, whether mentioned here or not, require about the same kind of preparatory treatment, which, as already described, has in view the formation of vigorous roots after a period of rest. For this purpose they should be selected early in the season, so as to become well established before winter. But without such special and extended preparation, many of the common bedding plants, as I have already hinted, may be brought into service by simply *prolonging* their period of bloom. This can be done more effectually if

they are young plants which have begun flowering late in the season, or have been held somewhat in check; better still, if they have been lifted, potted, and trimmed in the latter part of August. On the approach of frost, Geraniums of all sorts, Fuchsias, Passifloras, Petunias, Pansies, Lobelias, Abutilons, Ageratums, Cupheas, Chrysanthemums, etc., may be transferred to the sunny windows of an airy room with but little interruption to their bloom for several weeks. Under the most favorable circumstances some of them may continue flowering far into the winter. In this list may be included a considerable number of plants started from seed in the summer or early autumn, such as Mignonette, Sweet Alyssum, etc. Such experiments, I am assured, have been made repeatedly and with complete success. So it appears that, for at least the early part of winter, no one having a home need be without the brightness and beauty of bloom.

LIQUID FERTILIZERS.

For the ordinary growth of plants the soil in the pots is supposed to contain sufficient nutriment, since every shifting adds a fresh supply. But during the whole process of flowering, the demand becomes temporarily increased, and is most conveniently supplied by some kind of plant-food in a liquid form. The *best* is had by putting a quantity of old and well-rotted horse or cow-manure into a pail, tub, or other receptacle, and keeping it filled with water; the liquid to be applied freely when "diluted to the color of weak tea." The addition of charcoal is said to neutralize any offensive odor, but the soil in the pots soon produces the same effect. As a substitute, when necessary, *Aqua Ammoniæ* may be used moderately, in the proportion of one teaspoonful to a quart of water. Guano is sometimes applied to plants in pots, especially budding Fuchsias and Geraniums, having been first dissolved in hot water, one teaspoonful to a gallon; but its use is rather unsafe for the plants

except in skillful hands. Pigeon or hen-manure, which is somewhat less objectionable, may be prepared in the same proportions. Soot dissolved in water, two tablespoonfuls to a gallon, is highly recommended for Roses, and is doubtless suitable for many other plants.

The application of these liquid fertilizers—preferring always the best—should not be more frequent than once or twice a week at the time for watering, and should be confined for the most part to growing plants while they are budding and flowering. For obvious reasons it should never be allowed in the case of sickly plants, unless the sickliness arises from impoverishment of the soil. Whenever repotting becomes undesirable on any account, such as the size or situation of the plant, then of course the deficiency of nutriment may well be supplied in the manner here provided. So also with any bulbs or tubers growing in glasses filled with water. For the present purpose, the forcing of winter-bloom, if excess is avoided, the benefit is unquestionable, as you will see in the increased size, number, and beauty of your flowers.

I ought not to dismiss this delightful subject of winter-bloom without a hint or two on the

CARE OF THE FLOWERS.

If your Carnations show a tendency to burst open on one side, confine the petals within regular bounds by tying the calyx with a thread of green "to match," or using the smallest kind of stationer's India-rubber ring.

Remove flowers of every kind as soon as their beauty is gone. You cannot afford the expenditure incurred by the forming and ripening of seed. The same rule may well be observed in the outside garden.

To prolong the freshness and beauty of the flowers after they have opened, give them some protection from the rays of the sun when most intense; and, to make this caution necessary, may you have no lack of winter-bloom.

CHAPTER VII.

FURNISHING AND FIXING.

THE GARDEN-BOX.—VARIOUS VASES.—HANGING BASKETS.—SIDE-BRACKETS.

THE chief furnishing of your "greeneries" consists, of course, in the plants themselves; but the plants need more or less of some sort of furniture, and are worthy of being so fixed as to appear to the best possible advantage. This furnishing and fixing may be of the greatest variety, providing primarily for all the actual needs of the plants, and then admitting of the exercise and gratification of your tastes to an almost unlimited extent. You will find it a work of continual interest, to be done not in a day, but progressively, as improvements are suggested. Even the directions concerning it which I venture to give are to be regarded simply as preliminary suggestions, to be followed or modified, according to circumstances.

THE GARDEN-BOX.

This piece of furniture is of the first importance, because it combines so many advantages, obviating much of the trouble connected with the care of house plants in winter. It protects from the sunshine the sides of the pots, and conceals from sight such as are unsightly. It

holds a layer of sand, to catch any overflow of water and return it in a moister atmosphere for the plants. When set so low that the tops of the pots are nearly level with the bottom of the window, it makes only the forms of the plants conspicuous, and secures for them the largest amount of light direct from the sky. If fitted with casters, it is movable at pleasure ; and when it is made large enough to hold all the standing pots in a compact body, and is crowned with a vine-covered trellis, it forms a complete miniature garden on wheels.

While such a box may be made of any size, shape, materials, or cost, it is really the best when it answers to the greatest number of demands, or is most convenient. It is easily constructed at trifling cost as follows : Of pine or other soft wood—ends and bottom thick, and sides thin—nailed together, and painted outside and inside, or having zinc, instead of paint, as an inside bottom lining—about six inches deep, twenty inches wide, and long enough to suit the window —supported on a low, narrow bench or table, or by legs of its own, and in either case fitted with casters. Instead of paint for the outside, a friend of mine has used *floor oil-cloth* of a pattern representing tiles ; and he tells me that it could not be distinguished a few feet off from the expensive tile-covered boxes. This hint, I imagine, you will not be slow to accept. The box may be completed by having attached to the ends light wooden posts about an inch in diameter, extending to any convenient height, and connected at the

Fig. 9.—GARDEN-BOX.

top by an arch of strong iron wire, or by a wooden hoop stretched open and firmly fastened.

If the posts are set at the four corners, the connecting arches of wire or wood may be crossed at the center, and made to hold a small hanging-basket, while the whole frame-work becomes a well-braced and beautiful support for vines climbing from pots concealed at the bottom. If the box is made a foot or two longer than the width of the window, you will find the partially shaded ends useful for plants needing shade or rest. In the further arrangement of the plants, consult first their needs, and then your own tastes. Cover the bottom of the box with half an inch or more of sand, set the smaller pots on pieces of brick, fill all the vacant spaces with fresh moss from the woods, and you will have at least a good foundation for a winter window-garden. Figure 9 will serve as a suggestion for a Garden-Box of this kind.

But I must tell you here how two such boxes were used one winter, long ago, by the friend just referred to. By the way, do you read the *American Agriculturist?* Well, the editor set the boxes in the windows of a room seldom warmed or occupied—a "regulation parlor," wisely converted now to higher uses—and there he filled them with Evergreens, Dwarf Spruces, Retinisporas, Swedish Junipers, and the like. All winter long these "*friz and thew,*" as he merrily says, "yet were always green and cheerful, and in spring went out into the garden." So here is another hint for you, if any of your homes have *Arctic Zones.*

VARIOUS VASES.

With the garden-box at one window, an agreeable variety is obtained by having at another several small vases, or a single large one. They are made of different materials, sizes, and patterns, many of which are both cheap and elegant. If none of these are at hand, a good sub-

stitute may be found in vases easily made of wood. For example, a section sawed off from a smooth barrel, firkin, or keg, and fastened upon the top of some kind of rustic tripod, or upon a turned column attached to a base of sufficient breadth. Such a vase, if large and low, should be fitted with casters, and used somewhat like the garden-box. If small and higher than the window-sill, it can soon be covered on the side toward the light with the foliage of drooping vines. I find small vases set upon the floor very convenient for tall plants like the Calla, *Ficus elastica*, etc.

HANGING BASKETS.

Very necessary articles of furniture they are, and altogether worthy of the popular favor they have gained. Without them, many a little greenery could not exist at all, and they are never absent from the largest. Though they can not take the place of the box or the vase, they are more easily available, and afford many supplemental advantages. Suspended at different points in the window, above the garden-box, they bring the plants near to the light while forming a most beautiful screen. They are specially conspicuous, and comparatively out of the way. Their elevated position gives to "droopers" the opportunity to droop, and secures for tropical plants the higher degrees of temperature. The space they occupy could not well be used in any other way, and is, therefore, just so much clear gain of plant-room. Blessed be the man or the woman who invented them.

"Baskets" seems to be the common name for all sorts—for rustic boxes of wood and earthen pots or basins, as well as for baskets made of wire and lined with moss. The last are very beautiful when the moss is fresh and green, but they are not suitable for the room on account of the work they make for the broom. Those of rustic

wood-work are cleanly enough, but are exceedingly wooden. The earthen, or terra-cotta, pots or basins are in many respects the best, and can easily be obtained in all sizes, shapes, and colors, glazed or unglazed. For obvious reasons, the smaller sizes should be deeper in proportion to their diameter than the larger ones. Give the preference to such as will not topple over when you set them down on a table, as you will often have occasion to do.

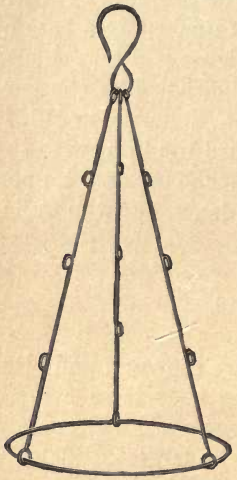


Fig. 10.—WIRES AND HOOK.

The chains commonly used in suspending them are so inconvenient, that you will do well to substitute strands of wire stiff enough to keep their place, and give support to "climbers." For this purpose, copper wire of the size of a coarse knitting-needle is the best. It will not rust like iron, and is so flexible that with a pair of nippers, or pliers, you can fashion it as you choose. Cut the pieces several inches longer than you desire them to be when attached to the pot. In order to make them better supports, form knots or loops at intervals of three or four inches. Do this by winding the wire once or twice around a common lead-pencil, and giving the pencil a turn or two to fasten the loop. Instead of a ring for the upper attachment of the strands, use a hook made of heavy iron wire, in the form of the letter S, with bottom curve closed. This method of arranging the wires and hook is shown in figure 10. You can then hang the basket upon a loop

Fig 11. SUSPENDING.

of wire let down from the top casing (as in figure 11), or upon a horizontal rod fastened across the window, and may vary the elevation by links or hooks of wire of different lengths.

To increase the number and variety of your hanging plant-nests, take open sea-shells, and pierce them at three points on the upper side for the wires, and once at the bottom for drainage ; or, select any kind of wooden box, large or small, fix suspending wires at the four corners, and fill it with plants in pots concealed by moss. Better still, by the use of a little ingenuity and wire, transform any ordinary pot for promotion. Take an empty one an inch larger than the one you wish to hang, and having turned it bottom side up, make a ring of strong wire around the rim, and then a net-work of small wire over the bottom and sides, so as to form a basket of the size and shape of the pot. Line this net-work with moss, attach suspending wires, set in the pot for which it was designed, and you have a fine hanging basket, on which I shall make no charge for patent right.

After selecting or making your hanging baskets comes the work of arranging them—a still further opportunity for both taste and skill. In my opinion, three or four of the smaller size, *each having its one kind of plant*, will produce a better effect in the window and be more likely to thrive than a single large one crowded with different plants. Large, overflowing baskets are very fine in the greenhouse, or under the open veranda in summer time, where they have an abundance of light and air ; but in winter they suffer so much in their narrow window quarters that I have almost entirely put them aside for these small substitutes. Climbing and trailing plants of delicate form may be so combined in these nests as to leave them scarcely visible, and in course of time they will require such shifting to the larger size as to give you all the variety you can desire.

SIDE-BRACKETS.

Pots placed on brackets attached to the sides of the window at different elevations have all the advantages of hanging baskets except the middle position. As any common earthenware pot may be so used, only the brackets need description. The kinds generally kept for sale by dealers in florist's goods are, of course, the most elegant. Some are fixed or stationary, others swing on pivots and are therefore more desirable. An iron arm projecting a foot, more or less, terminates in a disk or cup to hold the pot, and several such arms or cups are sometimes united in a single bracket. But a cheaper and very convenient bracket can be made by any blacksmith; it has somewhat the shape of the capital L, and is designed to be hung upon a nail or knob, against the wall or window-casing, the horizontal part being simply a ring into which the pot is set. It is sometimes made, like fig. 12, with two unequal rings, either of which may be so used.

Fig. 12.—BRACKET.

A similar one, and quite as good, as shown in fig. 13, you yourselves can make out of strong wire, which should not be less than one-eighth of an inch in diameter. First bend it around an inverted pot of the desired size at a point midway between the top and bottom, and, having thus formed the ring, bend the wire so as to bring it together for a horizontal arm about two inches long; then turn at a right angle one part downward for a brace, and the other upward for attachment to the nail or knob. The lower part forming the brace should be bent in the shape of a circle or triangle, so as to rest flat and firm against the wall; and the upper part should terminate in a small ring or hook for the nail. Bind the arm with

small copper wire, so that the ring for the pot will not spread open. Figure 14 shows the bracket in use.

If your windows are deeply seated in thick walls, you may literally cover the broad, side or jamb-casings with plants perched on these brackets. With an eastern or western exposure, the casing on the south side will have less sunshine than the other, and be just the place for

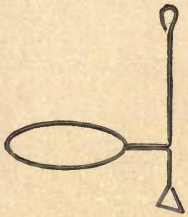


Fig. 13.—WIRE BRACKET.

Fig. 14.—BRACKET WITH POT.

plants requiring shade. Climbers and droopers may be used very effectively, with a small pot interspersed here and there of some fine foliage plant, such as a Coleus on the sunny side, and a *Begonia Rex* on the other. A window thus lined on its sides with masses of variegated foliage, and having a well-filled garden-box at its base, with a variety of hanging baskets centrally grouped above, forms a living picture well framed, and far more beautiful than art alone can ever produce.

SHELL FOR PLANTS.

CHAPTER VIII.

FURNISHING AND FIXING.—CONTINUED.

SUPPORTS AND SHAPES.—NATURAL TRAINING.—WARDIAN CASES.

INTERRUPTIONS and resumptions—such is life! Such, at least, will doubtless be the order of work in your "greeneries." But a pleasant work is only the more pleasant, if, like this, it may be continued. And now we come to the artistic question of

SUPPORTS AND SHAPES.

The beauty of many greeneries is almost spoiled by unsightly stakes and huge trellises, which are more conspicuous than the plants themselves. When a delicate vine in the window is made to climb upon a frame-work strong enough for a grape-vine in the garden, there is concealment as well as support, and more of carpentry than greenery. Supports of some kind are, of course, indispensable, not only with vines, but with all tender and rapidly-growing plants; so it becomes a question of some importance how to furnish and fix them.

The best answer, as to material at least, comes from nature. So far as possible, let the supports be of natural growth, in natural color and form—slender shoots and branches from hard-wooded trees and bushes. These change only their place and manner of service in coming

to you, and so they perfectly harmonize with the leaves and flowers which they now artificially support. If they are too slender for their purpose when taken singly, two or three may be used in a self-bracing position, and wired together at the top. To give them greater firmness in the pot, set with each another short stake of wood or iron projecting an inch above the soil, and clasp them with a bit of wire. Such supports you will find as durable as the best in the market, and far more suitable. They are wholly unobtrusive, indeed, hardly distinguishable; and this is recommendation enough if the plants are the things to be seen.

Taking this hint in making selection of any necessary substitute, I know of nothing better than the copper-wire already mentioned. This in many cases may be used alone with good effect. For instance, when the bracket-pots or hanging-baskets contain such vines as the *Ficus repens* or *Hedera gracilis* in a luxuriant condition, you may wish to train their growth downward and upward and outward. This I have often found absolutely necessary in order to accommodate the overflow. In such a case, the wire is the support *par excellence*. Taking a piece of suitable length, attach the ends to the pot or basket, and make a sort of *apron* in outline of any pattern to suit your taste. With one or two cross-pieces to hold it in place, you will have a firm support, and may have a beautiful shape for the mass of drooping foliage. For the upward and outward growth, make a hoop or other symmetrical form of any size desired, and fasten it firmly to two of the suspending wires of the basket di-

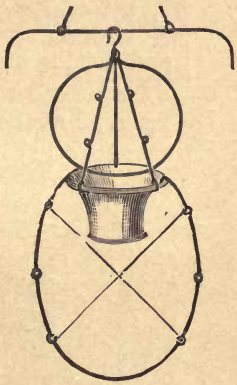


Fig. 15.—WIRE SUPPORTS.

rectly under the hook. The diagram, figure 15, will give an idea of this arrangement. When the whole is covered with living green, the outline against the window will not be the least of the attractions. So, in many other instances in the artificial training of your vines, you can use this pliable wire in executing your own designs.

NATURAL TRAINING.

But with all your plants, whether they need supports or not, the training must be attended to in order to secure regular and beautiful shapes. And this is within your power more than perhaps you are aware. You can make a growing plant do almost anything not directly contrary to the law of its nature. It is against the nature of a vine to grow in the form and manner of a tree, and attempted compulsion would produce only a sorry imitation; and yet the natural growth of a vine may be considerably modified or controlled.

Let us see, for example, what can be done with an Ivy. Take a young thrifty plant of *Hedera gracilis*, a rapid and graceful grower. It has a single stem, eight inches long, we will say, at the end of which is a "terminal bud," where the growth is now going forward. But other undeveloped buds lie concealed at the axil of every leaf, which may or may not start into growth. If the growth is left wholly uncontrolled, the single stem would probably extend itself to great length without one lateral branch. But if now you pinch off the terminal bud, or take a "cutting" for use, you compel the growth of some of the lateral buds. Perhaps several will start, but let us suppose this of only one, at the leaf next to the

Fig. 16.—TRAINED IVY.

end. If this alone were allowed to grow, the result would be the same as before, with a slight angle of the stem at the point of the new departure. But after it is well started, pinch it back close to the main stem and await developments. If the plant is strong enough, you will soon find a bud starting out at each side of the little stub left by the pinching back; and these will give two equal stems in place of the one. When they have grown as far as you wish, repeat the process of pinching or cutting, and each will give you two more stems; and so again and again in a manner most interesting. Thus, in course of time, you can train a well-rooted ivy in the shape of an open fan or the semblance of a bush, as shown in the diagram (figure 16).

To give it something like the form of a tree, you must fix a suitable support. Take three flexible shoots such

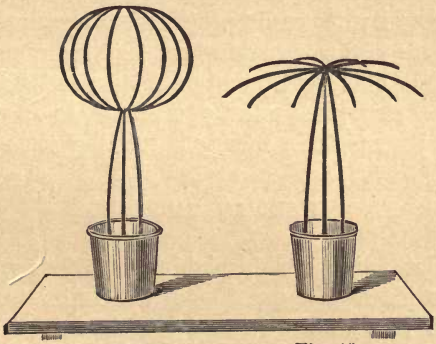


Fig. 17. Fig. 18.

as boys often get for whips, and put them into the pot about three inches apart to secure the greater firmness. Fifteen or twenty inches above the pot, bring them across each other and fasten them together with a bit of copper wire. Then bend the tops into any form desired, completing it with twigs or pieces of wire, and you have a skeleton which needs only a clothing of vegetable life to be

beautiful, if not arborescent. Make the experiment, and see how nature submits to the hand of the artist. Two forms of supports are here given ; in figure 17 the sticks are fashioned to make a globe, and in figure 18 the form of an umbrella.

With all hard-wooded plants, and many others also, this work of pinching or cutting back is necessary to give them a compact and symmetrical shape. Where the shoots bear the flower-buds, they must of course be left until the flowers are produced, and receive at some time subsequent more or less of cutting back. Roses and Fuchsias, you remember, are to have this treatment when brought from their dormant state in the cellar ; Daphnes and Azaleas, before going out to their summer's rest in the garden ; and Carnations, while undergoing their preparation for winter-flowering. But with very many plants it is better to prevent the straggling growth, and the consequent necessity of pruning, by simply pinching off the terminal buds just when and where the straggling begins. With a little observation and practice you will soon be able to keep your plants neat and attractive in shape, by exercising your taste in merely regulating their growth.

WARDIAN CASES.

We cannot finish our furnishing and fixing, without at least considering the question of these miniature greenhouses. Unless we can manage to obtain them in some way, and of some kind, we must relinquish all hope of having as our permanent home companions, some of the most delicate and beautiful plants that grow. So the question of what and how has a good claim to consideration.

The only difficulty, I presume, is the cost. "Wardian Cases" have been generally ranked as articles of luxury and made to correspond. The common and cheaper "glass shades" might serve for single specimens of

plants, but they are quite to small for our ambition—more like an inverted goblet than a Wardian Case. And yet our case is not so desperate as to exclude all hope of suitable cases for our plants. If the regular manufacturers will not or can not supply a cheaper kind for popular use, we can turn manufacturers ourselves, as some of my neighbors have done, with no other cost than that of materials. At least we can plan and superintend the manufacture, bearing in mind that the Wardian Case, pure and simple, is only a suitable *glass box* inverted over a suitable "garden box."

Here is a plan, "respectfully submitted," which any cabinet-maker or joiner—perhaps that "big brother"—can easily translate from the ideal to the real: The *frame* for the glass to be made of black walnut, or even of pine, as light as is possible with strength sufficient to hold the glass together—the corner and top parts about an inch thick and rounded outside, and the bottom part somewhat heavier, like that of a window-sash—size *inside*, 30 inches long, 15 wide, and 18 high, requiring two panes of glass, 15 by 18 inches, two, 30 by 18, and one, 30 by 15—the glass to be set with putty so as to leave as little as possible of the wood exposed to the moist air of the case, and the top pane to be hinged or left movable for convenient access to the inside. The *base*, or "garden-box," to be of the same kind of wood and of the same size outside, with a moulding projecting half an inch above the upper edge to hold the glass frame firmly in place—to be six inches deep and lined with zinc, which should overlap the upper edges so as to catch any drip of moisture from the glass, and have at the bottom for drainage outlet a small tube closed with cork—the whole to rest on legs or a table fitted with casters.

If you find it inconvenient to purchase the more costly and elaborate sort, this "home-made" case, or even a much cheaper one, with small panes of glass in a pine

sash, will answer every purpose of use, while the plants may be depended on to furnish the beauty.

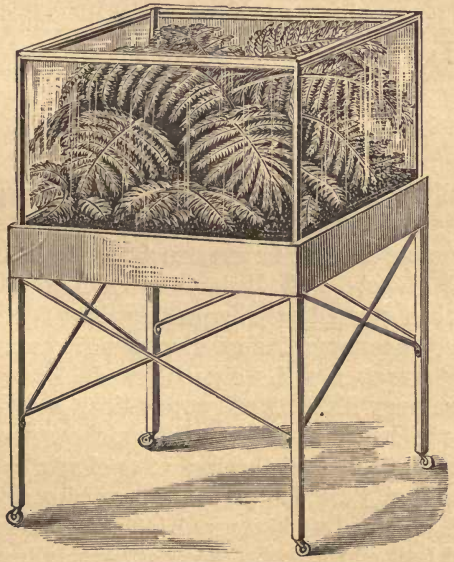
Now as the plants have already been selected [See Chap. III., Suitable Plants, under Selections], we have only to see to their proper accommodation in the case. By the ordinary method, the box is filled with soil, having about an inch of fine gravel and bits of charcoal at the bottom for drainage, and the plants are at once imbedded in it as in the open ground. A better plan, it seems to me, is suggested by the well-known advantages of pot culture. At any rate, I shall try it at the first opportunity, and do not hesitate to recommend the experiment to you. After laying the drainage material at the bottom, set in the largest pots and add sufficient soil around them to bring up the next size of pots even, and so keep on adding layers of soil and pots, until all are in place with the rims at a common level just at the proper surface of the soil. This, you see, is only the "plunging" process on a small scale. It certainly has some very obvious advantages, such as the more convenient removal of any plant without disturbing the rest; while it is not open, so far as I can see, to any possible objections. It brings the plants sufficiently near together—they are generally quite too much crowded—and, like the other plan, it allows the whole surface of the soil to be covered with a mat of Lycopodiums or Selaginellas, and creeping Ferns.

The soil, with either method, should be more than usually light, and composed very largely of leaf-mould from the woods.

The box having been satisfactorily filled, and once thoroughly watered, is ready to receive its glass covering and begin service. It will henceforward need light, all it can get, but not direct, or at least intense sunshine. It will ordinarily manage the rain for itself, like an independent little world, evaporating water from the soil and returning it condensed by the surface of the glass.

If the first supply has been excessive, allow it to pass off by slightly opening the top glass at some favorable time. Otherwise keep the case perfectly closed, except for the occasional removal of a dead leaf or frond, bearing in mind that its sole purpose is to give the enclosed plants a moist, still atmosphere of their own. With flowering plants, however, there must be more or less of ventilation, according to circumstances. A renewal of the water will not be needed for several weeks—perhaps months.

Instances are reported where small slow-growing plants in such cases have been left undisturbed for a long series of years, and have thrived during the whole time with only the slightest attention. But if we can prove in our "greeneries" only half the truth of all that is said, we may well consent with the "Wardian Case" to complete our furnishing and fixing.



HOME-MADE WARDIAN CASE.

CHAPTER IX.

PROPAGATION OF PLANTS.

PLANTS FROM CUTTINGS.—SEEDS AND SEEDLINGS.—PLANTS BY MAIL.

I AM pleased to see by your questions that you are not content with depending entirely upon other people for supplies. The propagation of plants by yourselves may not be really necessary to stock your Winter Greeneries; but it is a work of so much interest that I am not surprised at your undertaking it, and very gladly give you any help within my power.

PLANTS FROM CUTTINGS.

The failure with your cuttings is easily accounted for, both place and time having been unfavorable. Comparatively few cuttings will strike root readily in the ordinary soil of pots, and during the cold of midwinter. Florists then succeed only by making the "cutting-bed" several degrees warmer than the surrounding atmosphere, and they always use the cleanest sand. Besides, some plants are very difficult of propagation, and often fail even in the hands of florists; but with very many you will succeed finely by following a few simple directions.

1. The best time for your purpose is spring, when nearly all plants start into new life under the increasing light and heat of the sun. The hottest weather of mid-

summer is with some quite as unfavorable as the coldest of midwinter. You would probably succeed were you to begin your experiments by the 1st of March, and continue them three or four months.

2. Select for cuttings only the strongest shoots of recent growth. Any others will either fail to take root, or will make very puny and feeble plants.

3. Make the cut with a sharp knife, in a somewhat slanting direction, just below a leaf-joint—the third, fourth, or fifth from the end. Trim off two or three of the lower leaves, allowing one or two next to the terminal bud to remain, and the cutting is ready for the sand.

The point at which to make the cut is a matter of some importance. With some few plants roots will grow *only* from a leaf-joint, and with perhaps nearly all rather more readily from that point than any other. If the cutting is very tender, it will rot, or "damp off;" if old and hard, it takes a longer time for the roots to start, if they start at all. The best point is, therefore, somewhere between these two extremes—some florists say, just where the stem will *break and snap apart on being bent.*

4. Wash the sand perfectly clean, and put it in a water-tight dish—a coffee-cup, or something larger. Insert the cuttings without crowding more closely than contact of the leaves, and keep them as much as possible in the sunshine, with the sand thoroughly wet—"wet as mud."

5. Examine the cuttings occasionally by lifting some of them carefully from the sand. When any one is found to have roots about half an inch long, remove it to the smallest sized pot, and accord to it the dignity of a new and separate plant. The time required to form the roots varies from a week to a month or more, and there is hope so long as the surface of the cut is sound and hard.

6. For cuttings of Ivy, Oleander, and some other woody plants, a small glass bottle filled with water will

be more convenient than a dish of sand, and will be quite as good in all respects.

7. Another method is sometimes used by florists with soft-stemmed plants, like the Geranium, which entirely dispenses with the cutting-dish or bed, and is said to be very successful. The stem is partly broken off at the proper point, but is not detached until the surface of the fracture becomes hardened or "callused;" then it is potted at once, and soon takes root in the soil. The callus seems to be always the precedent condition of rooting, and its formation is thus secured in the open air without danger of "damping off."

8. If with any particular kind of plant the cuttings all fail to send out roots, then resort to half-cuttings, or "layers," as they are called. The operation is easily managed in the house by using a small pot for the "layer" near the larger one. Selecting a shoot or branch that may be laid down, make the cut half way through, and half an inch along the center, and then carefully bend the split part open, press it into the soil an inch deep, and fasten it down with a forked twig, or a bit of wire bent like a hair-pin. This method, as you see, gives to the cutting a partial support while the roots are forming, and so has the advantage of being rather more sure than the other; but it generally requires a longer time, and is much less convenient.

Do not fail on any account to make a thorough trial of the cutting-dish, or "saucer system," as it is called. Your success will probably exceed your expectations, and it may occasionally treat you to a delightful surprise, such as that of saving a plant supposed to be lost.

For example, I once brought home a Coleus of a rare variety, planted it out in the garden, and soon after found it cut down close to the ground by a worm—nothing left but a stem about two inches long. This was put into the cutting-dish, and within ten days was nicely

rooted and potted, and it afterward flourished as if nothing had happened. It was an unexpected success, turning defeat into triumph, and relieving me somewhat from the feeling of utter helplessness against the cut-worms. I may add that the same cutting-dish, only eight inches long, sometimes turned out in a single week twenty-five plants, and became during the season the fountain of a large and gratuitous supply.

So I am very confident that your cutting-dishes will be sure "to pay" in the best sense, and in more ways than one. Some plants are not easily obtained even with money, but some friend of yours has a specimen which can spare a cutting, and the dish soon puts you in possession of a plant having the added fragrance of friendship; or you render a similar service to others, and if "it is more blessed to give than to receive," your pleasure is only the greater. Among yourselves, at least, you will be very likely in this way to share the possession of any highly prized plant, provided it will grow from cuttings. In all cases no small benefit will come from the fact that the plants have been *started by your own hands.* This will give you a new sense of power, and a feeling of interest and ownership not connected with plants for which you are indebted to other people's labor and skill. And is not this a sufficient inducement to renew your attempts to grow plants from cuttings?

SEEDS AND SEEDLINGS.

In this whole matter of starting new plants for yourselves—a work well worth undertaking for its interest if not for its profit—you will be most likely to succeed if at the outset you clearly understand some of the differences between plants from seeds and plants from cuttings. Let me therefore mention a few important facts, even though you may already know them.

In the first place, many flower seeds are exceedingly small, perhaps "the least of all seeds." On looking at them, you wonder that they can ever produce the great plants from which they come, and, in fact, the most of them never do. At any rate, they must run the gauntlet of many perils. Owing to their minuteness they are very liable to be overwhelmed in the soil, and thus destroyed. If they germinate at all, the seedlings are so fragile as to yield to the slightest disturbance, even that of watering from a fine rose sprinkler, unless it is managed with great care. And then, with all the dangers passed, there is a large amount of growing to be done which, of course, requires time of corresponding extent. Very different in all respects is the well-selected cutting or layer. As it has scarcely any infancy at all, it has few critical stages to pass. With its roots well started, it is already a half-grown plant, and will soon attain its "majority." Such differences as these must be of considerable importance to all winter greeneries.

Observe, still further, that a seed has the advantage or disadvantage of being a *new product*. It is often, not always, derived from two somewhat different plants, as in "cross fertilization." In such case, it produces an entirely new plant, which partakes of the characteristics of both the parent plants, resembling each, differing from each, and constituting sometimes an improved variety. Suffice it to say, there are many differences between the seedling and the parent plant, or plants, resulting from the process of fertilization, whether controlled or left to itself. It is this fact which gives to "seed-growing" the dignity of an art; at the same time, it explains such expressions as "not coming true from seed," "the running out of varieties," etc. Now, on the other hand, a rooted cutting is, in the strictest sense, only a part of the plant from which it is taken. It is as really identical as if it had been obtained by a division of the roots. It therefore

admits of no change of essential characteristics, and must infallibly preserve the variety. For this reason florists generally depend upon cuttings, layers, or root divisions, when they would be absolutely sure of results. In view of these facts, you will not depend entirely, or even chiefly, upon seedlings to supply your needs.

Nevertheless, your question may be answered in the affirmative. Besides the large number of annuals and biennials commonly cultivated in summer gardens, there are a few greenhouse perennials which may be easily grown from seeds, such as *Ageratum, Cyclamen Persicum, Centaureas, Cinerarias, Mesembryanthemums* (Ice and Dew plants), *Primulas,* etc. With all such plants seedlings may be preferred, on the score of cheapness in first cost at least. Even with the more difficult kinds, like *Cobœa scandens, Mimulus, "Smilax,"* or any others, it may be worth while for you to make the experiment, if only for the sake of experimenting. The cost in money will be small, whatever it may be in time and labor. With sufficient leisure for the purpose, there is certainly no small pleasure in watching the daily growth of a plant, and even in caring for its tenderest infancy; and who is better fitted than yourselves to undertake such care, or could better hope for skill with experience?

In all cases, however, you will need at the *beginning* a few helpful hints. The florists generally give something like the following:

1. Use only light, finely-pulverized soil, and for the house let it be in shallow boxes, or in pots, choosing such as are desired for the plants, if they are not to be transplanted.

2. If the seeds are somewhat coarse, sprinkle the soil over them to the depth of two or three times their diameter; if very fine, give no covering at all, but lightly press the soil with anything having a flat surface like the bottom of a pot. Lay on temporarily a piece of cotton

cloth or flannel to prevent disturbance in watering; and in order to retard evaporation, and thus diminish the need of watering, keep panes of glass over the boxes or pots until their removal becomes necessary.

3. When the seedlings begin to appear, remove the cloth covering, and give them full light, but not sunshine; thin them out if crowded, and apply water with the utmost care.

4. Transplant as soon as they are able to bear it by gently lifting them from the soil with a bit of wood shaped like a paper-folder. Plants which are impatient of change, like Mignonette, should be transferred with the ball, or allowed to remain in the pot undisturbed.

5. Many common plants, like the Candytuft, Larkspurs, etc., do not require such anticipation of the season, and thrive best if sown like garden vegetables in the beds where they are to grow.

PLANTS BY MAIL.

As to the plants which you mention, they are among the most difficult to grow from seed, and yet very desirable for your greeneries. If you can not obtain cuttings from Judge Kent's gardener, perhaps you can purchase the plants in pots from some florist near at hand. Of course you will patronize your neighbors, for the sake of encouraging home industry, as well as for your own immediate advantage. But such plants are rarely kept for sale in small establishments, and, failing to find them there, you may safely have them, or any other small plants, sent to you from a distance through the mail.

The best time for you to order them is early in spring, while the weather is cool, but not cold. The plants are then in the best condition for such transportation, and may be obtained at the lowest prices on account of their accumulation in stock during the winter. Besides, they

will then have the advantage of the season in recovering from any possible ill effects of the journey, and in becoming fully established for future use in your greeneries.

Perhaps you wonder how delicate plants can endure such confinement in the mail for days together; but on opening the package you will discover the secret. The small ball of earth, the soft damp moss, the enfolding oil-paper, and the stiff outside wrapping furnish all the conditions of safety for the time required in a journey of hundreds of miles. In all respectable establishments, the art of packing is now carried to a high degree of perfection, and many thousands of plants are every year distributed from them through the mail all over the country with no loss whatever to their patrons. The gentlemen having them in charge may be relied upon, so far as my experience goes, to give entire satisfaction. I have received many such packages from a distance, some of them even in moderate midwinter, and in no instance with the least disappointment. The interest awakened by their anticipation and reception was almost boyish, but none the less pleasurable.

The reception which you give to these travellers by post should be a warm one; that is to say, if they are at all wilted, put them, root and branch, into tepid water for about fifteen minutes. Then give them the best soil in small clean pots, and let them rest for a few days in comparative shade. Soon they will be ready to take the regular fare of their new home, and may thenceforward be expected to behave quite as well as if they had been "to the manner born."

CHAPTER X.

ET CETERA.

USE OF THE CELLAR.—SUBSTITUTES FOR POTS.—AN OUTSIDE QUESTION.—THE CHILDREN'S SHARE.

ANOTHER note, bristling with interrogation points, remains to be answered. Its postscript informing me of your success is gratifying indeed, but that is no more than I have confidently expected, in view of your interest and energy. The cultivation of house plants in winter time has its difficulties, of course, like everything else worth accomplishing; but with well directed and persistent effort, it is very far from being impracticable, and must sooner or later achieve the merited success. So I do not wonder that your friends come to you with questions—"a thousand and one"—or that you find yourselves beset with questions of your own arising in the progress of your experiments and the anticipation of your needs. Such as you have referred to me do not all belong strictly, or necessarily, to the management of your "winter greeneries," but they are closely enough related to be worthy of the asking and the answering. The answers which I have to give will not comprise "all the rest" you need to know, but may serve to help you on to better sources of information.

USE OF THE CELLAR.

So many references to the "the cellar" have been made heretofore, that I have half expected your request for all "the whats and hows" of its use in connection with the greenery. But you will doubtless be able in most cases to decide these questions for yourselves on the "general principles" already considered, such as the necessity of regulating the light by the temperature, and the watering by the condition of the plant, etc. A few suggestions, however, may be of service to you at the beginning.

The cellar will be best suited to your purpose if it has an even temperature of about 40 degrees, with a moderate amount of light from the outside, something like a strong twilight. To secure both together, it may be necessary to glaze the windows on the inside of the sash, thus giving them double walls of glass and confined air between. Having such a cellar, you will probably find no better place in which to keep a supply of soil and pots, and do the work of the "potting bench;" but you will use it chiefly for the safe storage of your plants while they are waiting as candidates for the honors of the greenery, as mentioned under Roses and Bulbs, or whenever they need to be sent into retirement. Here several precautions are in order:

1. Let the transition of the plants from one extreme to the other be as gradual as possible, that is to say, directly from the brightest and warmest part of the cellar to the darkest and coolest place in the greenery, and *vice versa.*

2. When room must be made by removing some of the plants to the cellar, take only such as are in a state of rest, and are therefore somewhat prepared for the change.

3. Plants that are entirely dormant need less light than those which retain their leaves, and so may be kept

in the darker corners until near the time of their promotion.

4. Watering in the cellar requires the utmost possible care—much more, indeed, than elsewhere. It should be done by "beginners," not on mere conjecture, but only after turning out and examining the ball, bearing in mind the rules [see Chap. VI.] concerning wholly and partly dormant plants. If you can hit upon the right treatment as to watering, you will be most likely to succeed in joining safety with storage.

5. Large plants used in summer for the decoration of the veranda, or the lawn, which are quite too cumbersome to be taken into and form a part of the greenery, may be safely stored in the cellar; for example, *Agave*, or Century Plant, the nearly hardy Palms, Oleanders, and many others.

Perhaps I ought to add that the cellar may be used in connection with the summer garden for the safe keeping of many plants which can not be sufficiently protected outside to endure the winter, such as Lemon Verbenas, Hydrangeas, Geraniums, etc. Also the roots of Dahlias, Cannas, and others, as well as Gladiolus, and other bulbs, to be planted in spring. Indeed, so useful is the cellar that florists and nurserymen frequently construct what are practically cellars—*i. e.*, large covered pits for the purpose of storing plants during winter.

SUBSTITUTES FOR POTS.

Your friend, "who lives in such an out-of-the-way place," must labor under some disadvantages in managing her winter greenery. The plants she can obtain without difficulty, some of them from the woods, and others by mail; but the common earthen pots are so fragile as not to bear rough transportation unless very carefully packed. If she cannot in this way obtain what she needs, "are there any good substitutes?"

Not very good, I fear, and yet something can be done. Perhaps she has a young brother who has not yet passed the "mud-pie" stage of boyhood. If so, how would it do to send him to a bank of good stiff clay, with two or three blocks of proper size and shape, and let him try his art in the line of useful pottery? If well-worked clay were plastered about one-fourth of an inch thick over such blocks, and then dried in the sun or baked in an oven, perhaps the pots would render her good service. At any rate such rude pottery has the odor of antiquity and the sanction of long and varied usage.

Another possible substitute, equally rude and ancient, as a use of osier, is suggested by Spenser's lines:

> "Each a little wicker-basket had,
> Made of fine twigs, entrailed curiously."

Little or large, and of any form desired, cradles for her plants your friend can easily make of these fine twigs alone, "entrailed curiously." Or, taking strips of compact moss or well-matted sod and cutting them to the proper shape, she can bind them firmly together with wicker-work of the simplest kind, and thus have pots porous enough for the plants and green enough for any greenery. When such vegetable pots have decayed, they will doubtless be filled with roots, like the balls of earth in common pots, and need only a new wrapping of osier and green.

As a last resort, she may use the tin cans in which fruit has been preserved. They are without doubt more convenient for her than suitable for her plants. But if provided with an inch of gravel and charcoal at the bottom for drainage, besides one or two apertures a fourth of an inch in diameter, they will serve well for the *Ivy, Ficus repens*, and the like, and may be tolerable for her more delicate plants. But let us hope that some enterprising tradesman of her neighborhood may soon become inter-

ested in winter greeneries at home, and add to his stock the coveted pots.

AN OUTSIDE QUESTION.

Yes, I fully agree with you concerning your venerable neighbor. Any old lady who has kept a solitary "Jerusalem Cherry" safely through the winter by carrying it down cellar every cold night, deserves all the help you can give in making the most of her little summer garden of "only three or four small beds." It is no wonder that you propose for her something "finer than Hollyhocks, Bouncing Bets, and Bachelor's Buttons." And who could help sharing your interest in the question, "What plants can she have which will give the most bloom with the least labor?" This question might safely be left to the combined wisdom of the young florists, who, if I remember correctly, "have no trouble with their plants in summer-time," and are already surmounting the difficulties of winter. But as you have generously taken me into your counsels, I must contribute my share by suggesting one of the many possible answers.

Geraniums are of course the first to be mentioned. They are cultivated so easily, and their flowers are so brilliant, abundant, and enduring, that no garden, large or small, can well dispense with them. They are now used almost everywhere for summer decoration, either in windows, or in groups outside. Here they seem to take the lead of all the flowering plants cultivated in our City Parks, where it is important to produce the most striking effect "with the least labor." You can probably have nothing better for the "small circular bed" than a well arranged group—the tall scarlet variety in the center, and the smaller Zonales at the outside.

For one of the "borders near the gate," I presume you will select four or five healthy *Verbenas* of different colors—one of them to be white for the sake of its fra-

grance at eventide. With abundant sunshine, and a deeply spaded soil made rich with old manure and rotted sod, they grow as luxuriantly as cucumber vines, a single plant sometimes covering several square yards, if a joint is now and then pegged down to furnish additional roots. Avoid the common mistake of setting them up straight and stiff as grenadiers with nodding plumes. If you take plants which have been grown in small pots until the latter part of May, set the balls nearly three feet apart, and about two inches below the surface of the soil in a slanting direction, spread out the stems as widely as possible, and pinch off the flowers in order to help forward the new growth. If insects appear, drench them with tobacco water. No further labor will be required other than cutting the flowers as they fade, and guiding the vines so as to cover all the ground. As to the profusion of bloom, I can only say, that in the course of a few weeks I once cut from a small bed several hundred flowers, and then stopped counting. Indeed, the more they were cut, the more abundant they seemed to be; and they gladdened us with their brightness even when the leaves of autumn were thickly falling.

And now for the other border, what shall the selection be? *Phlox Drummondii*, Balsams, Petunias, Heliotropes? It is hard to choose from so many favorites, but let us suppose the first. They are easily grown from seed sown early in the hot-bed, or in boxes in the house; and the flowers are wonderfully varied, beautiful, profuse, and persistent. They are more serviceable for bouquets and vases than Verbenas, and continue blooming quite as late in the season.

Perhaps you can make a place along the center of these borders for a few double *Balsams*. They afford a striking example of the achievements of floriculture, many of the flowers rivaling, both in form and color, the Rose and the Camellia. With nearly all of the side branches pinched

off, and with a liberal supply of the "liquid fertilizer," they will grow in dense masses along the tall stems, and scarcely interfere with their neighbors below. When cut, they can be used with fine effect in a saucer or shallow vase nearly filled with wet sand or moss.

In the "half-shaded corner," that Jerusalem Cherry should certainly have the reward of its winter service, sharing the place with Pansies, Lobelias, Fuchsias, etc. So the little garden may be literally filled with flowers all the season through, for there is no lack of profusely blooming plants.

But, after all, have I mistaken your question in thinking only of the labor required *during the growth* of the plants? The "most bloom" *after* "the least labor" is quite another matter. If the soil is not already good ground, deeply and thoroughly worked, let me hope that there will be no difficulty in securing this most necessary condition to the success of your generous enterprise.

THE CHILDREN'S SHARE.

Do you wonder that the younger brothers and sisters in your homes are following suit, and asking for "little greeneries all their own?" Such enthusiasm as yours could hardly stop with yourselves. And now it remains for you to cherish the interest which you have awakened, and give some direction and help to their small undertakings. Mere blocks of the floricultural alphabet will serve the purpose at first—seeds and tubers with moisture and warmth in the simplest combinations. They will have, for the children, all the charm of novelty and recreation blended with education, and will constitute at least the beginning of a genuine "*Kindergarten.*"

A few common examples may suggest to you many others equally simple and effective.

For Fred—and to be his own work—we will say, a

hanging-basket made of a turnip, by scooping out the inside so as to leave walls an inch thick, filling the cavity with soil, and sowing any quickly germinating seeds—the sprouts from both turnip and seeds combining to make the greenery.

For Lizzie, a glass goblet nearly filled with water containing a bit of charcoal to keep it sweet—coarse lace fastened across the top and covered with peas touching the water—or a disk of cotton-batting or thick flannel of the diameter of the glass laid on the surface of the water and sown with any fine seed, grass, mustard, flax-seed, or water-cress—to be kept in a warm dark place until the roots enter the water, and then brought to light for the growth of the green.

For the "little five-year-old," an acorn or a chestnut suspended by a thread over a cup of water, or loosely set in the neck of a well-filled vial, barely in contact with the water—making in its growth a greenery which is very small, but very full of interest, even to older heads. It affords constant opportunity to watch the process of germination, without the trouble of uncovering beans in the garden-beds.

The common pine-cone experiment will be more satisfactory if you fill the spaces behind the scales with fine soil before sowing the seed, and then keep the cones in wet sand or moss. Half a dozen such cones having each a distinct variety of grass, and grouped together in a vase filled with sand, will make an ornament not unworthy of either nursery or parlor.

The Madeira Vine, Sweet Potato, and other tubers may be grown in "glasses" like the Hyacinth, and should have precisely the same treatment. [See Chap. VI., Winter Bloom.] It is altogether a mistake to set the tubers "half in the water at the bottom of a vase," according to some printed directions. My first experiment "followed the book," and issued in an odor quite

unlike the perfume of flowers. Afterwards, with better counsel, success was complete—the long white roots filling every part of the glass, or large-neck bottle, and the beautiful vines retaining their foliage well through the season. It was a greenery which could not fail to interest the little folks, and might well delight even "children of a larger growth."

After these primary lessons in plant life—the visible germination and growth of seeds and tubers—have lost their novelty for the restless, growing youngsters in your homes, what then? Why, of course, let them advance to something higher—a rooted cutting, a little box of tiny plants in pots, a hanging-basket made of a cocoanut-shell and filled with soil and plants "*just like yours.*" Thus you give them in their earliest years just what they especially need as a part of their home education, something to do—something "all their own," to be interested in, to care for, to learn about, to grow with their growth and live in their life.

Could your experiments in floriculture have a better accompaniment than their efforts at imitation? Or a grander final result than their best culture and yours? What splendid opportunities you have! May you fully succeed in joining with the bloom of plants the flowering of beautiful character, and thus find in a simple "*Kindergarten*" the happiest use and highest worth of winter greeneries at home.

FINIS.

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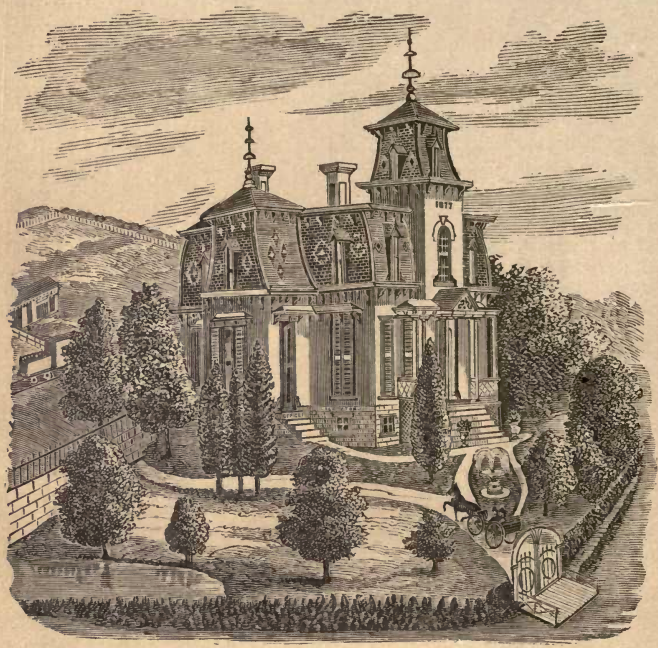

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